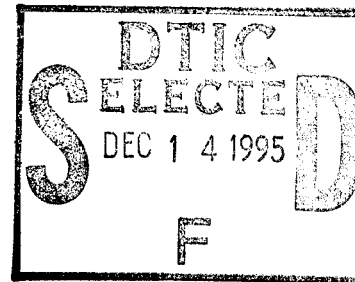


AIR FORCE HEALTH STUDY

An Epidemiologic Investigation of
Health Effects in Air Force Personnel
Following Exposure to Herbicides



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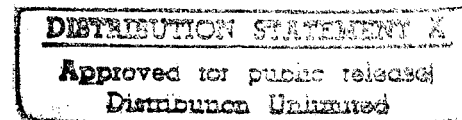
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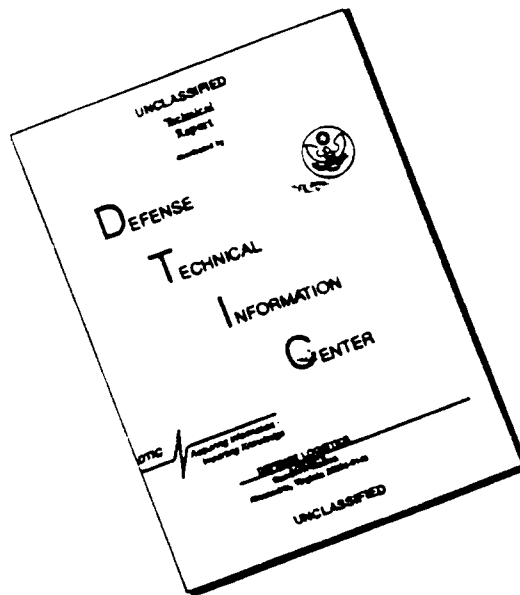
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AIR FORCE HEALTH STUDY

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May 1995

Volume VIII

1995 Followup Examination Results

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APPENDIX G-1.

Discussion of Vibrotactile Threshold Methodology and Dependent Variable-Covariate Associations for the Neurology Assessment

This appendix contains a description of the methodology used to obtain vibrotactile threshold measurements of the right and left great toes of all participants. This appendix also contains Table G-1-1, which shows results of tests of association between each dependent variable and candidate covariates for the adjusted analysis. Pearson's chi-square test (continuity-adjusted for 2×2 tables) is used for significance testing of the associations between each discrete dependent variable and the candidate covariate. When a candidate covariate is continuous in nature (for example, age), the covariate is discretized prior to the analysis of the discrete dependent variable. Pearson's correlation coefficient is used for significance testing of the associations between the natural logarithm of each continuous dependent variable and a continuous candidate covariate. When a candidate covariate is discrete in nature, means transformed from the natural logarithm scale to the original scale are presented, and an analysis of variance is used to investigate the difference between the means on the natural logarithm scale.

VIBROTACTILE THRESHOLD METHODOLOGY

Vibrotactile threshold measurements were made on the right and left great toes of 2,228 AFHS participants. These observed values were gathered using the Vibratron II, a machine generating measurements in vibrational units (vu). Because vu are only produced by the Vibratron II, vu need to be converted to a standardized unit, such as microns of displacement, to allow comparisons between thresholds generated by this study and thresholds ascertained in other studies. The conversion from vu to microns of displacement is given by

$$\text{microns} = k(\text{vu})^n$$

where k and n are machine-specific. For the Vibratron II machine used in the AFHS, k and n were estimated to be 0.550 and 2.02217 respectively. These constants were evaluated by Dr. Richard Letz of the Division of Environmental and Occupational Health at Emory University School of Public Health, who calibrated the Vibratron II machine used in the AFHS before and after vibrotactile measurements were taken (39). These two calibrations resulted in two estimates of both k and n . Both calibrations were necessary to determine whether or not the machine's measurement standard had shifted over time. The estimates of k and n did not change substantially between the two calibrations, and errors in vibrotactile threshold measurements contributed by the Vibratron II are assumed to be constant across time. The numbers 0.550 and 2.02217 resulted from Dr. Letz's final calibration. The initial calibration estimated k and n to be 0.539 and 2.0856 respectively. The results of a study to determine the relationship between the measurements using the initial estimates of k and n and the final estimates of k and n is described subsequently.

As an additional analytical issue, vibrotactile measurements were gathered at SCRF using the method of limits procedure, which produced seven measurements for each great

toe. In order to obtain one measurement per toe, a trimmed mean was calculated for each set of seven measurements for each toe using the following algorithm:

- Drop the first observation.
- From the remaining six observations, delete the minimum and maximum observations.
- Average the other four measurements to produce one measurement per toe.

Investigation of the trimmed means and observations composing the trimmed means revealed that each of these distributions are highly skewed (positive skewness). To produce symmetric distributions, a log transformation was applied to the data. The vibrotactile measurements analyzed in the AFHS were computed by first transforming the seven vibrotactile measurements for each great toe before calculating the trimmed mean.

To assess the effect of the sequence of operations (transforming and averaging) used to produce a single vibrotactile measurement on the statistical analysis, the trimmed mean on the log(micron) scale and the log of the trimmed mean on the micron scale were computed for each participant's right and left great toes (RTLOG, RLOGT, LTLOG, and LLOGT respectively). Scatterplots of RTLOG versus RLOGT and LTLOG versus LLOGT were produced, and the Pearson correlation coefficients for RTLOG and RLOGT along with LTLOG and LLOGT were calculated. The respective correlation coefficients were 0.99330 and 0.99610, which imply a strong linear relationship between the two methods of transformation. Examination of the scatterplots also confirmed the linear relationship. As a result of the linear association, statistical conclusions would not be affected by the sequence of operations (transforming and averaging) used to produce a vibrotactile measurement for each great toe.

Also, to study the effect of the change in k and n obtained from the two calibrations on vibrotactile measurements, RTLOG and LTLOG were computed using values of k and n obtained from the initial and final calibrations (RTLOGI, LTLOGI, RTLOGF, and LTLOGF respectively). Scatterplots of RTLOGI versus RTLOGF and LTLOGI versus LTLOGF were examined along with the Pearson correlation coefficients associated with the two plots. The scatterplots and correlation coefficients indicated a strong linear relationship between vibrotactile measurements computed with values of k and n from the initial calibration and vibrotactile measurements based on values of k and n from the final calibration. RTLOGI and RTLOGF had a correlation coefficient of 0.99996, while LTLOGI and LTLOGF had a correlation coefficient of 0.99997. Therefore, choosing values for k and n from the initial or final calibration would not affect statistical conclusions.

The trimmed mean on the log(micron) scale is equivalent to a geometric trimmed mean on the micron scale. Statistical analysis on the log(micron) scale is consistent with two other studies that investigated vibrotactile thresholds. One study examined reliability and time efficiency for obtaining vibrotactile measurements, while the other study determined the magnitude of effect modifiers on vibrotactile thresholds (38).

Table G-1-1.
Dependent Variable-Covariate Associations for the Neurology Assessment

Dependent Variable	Level	Age			Race		
		Born ≥1942	Born <1942	p-Value	Black	Non-Black	p-Value
Medical Records:							
Historical Neurological Disorders							
Inflammatory Diseases		(n=946)	(n=1,272)		(n=130)	(n=2,088)	
	Yes	0.4%	0.3%	0.950	0.0%	0.4%	0.999
Hereditary and Degenerative Diseases		(n=951)	(n=1,276)		(n=130)	(n=2,097)	
	Yes	4.6%	5.9%	0.229	6.2%	5.3%	0.824
Peripheral Disorders		(n=950)	(n=1,272)		(n=130)	(n=2,092)	
	Yes	12.2%	19.4%	<0.001	11.5%	16.6%	0.161
Other Neurological Disorders		(n=946)	(n=1,272)		(n=129)	(n=2,089)	
	Yes	14.6%	24.1%	<0.001	33.3%	19.2%	<0.001
Physical Examination:							
Cranial Nerve Function							
Smell		(n=951)	(n=1,277)		(n=130)	(n=2,098)	
	Abnormal	0.8%	1.8%	0.084	1.5%	1.4%	0.999
Visual Fields		(n=949)	(n=1,273)		(n=130)	(n=2,092)	
	Abnormal	0.1%	0.2%	0.833	0.0%	0.2%	0.999
Light Reaction		(n=950)	(n=1,275)		(n=130)	(n=2,095)	
	Abnormal	0.3%	0.4%	0.999	0.0%	0.4%	0.999
Ocular Movement		(n=950)	(n=1,275)		(n=130)	(n=2,095)	
	Abnormal	0.4%	0.7%	0.555	0.0%	0.6%	0.758
Facial Sensation		(n=951)	(n=1,277)		(n=130)	(n=2,098)	
	Abnormal	0.1%	0.2%	0.834	0.0%	0.2%	0.999
Jaw Clench		(n=951)	(n=1,277)		(n=130)	(n=2,098)	
	Deviated	0.0%	0.1%	0.999	0.0%	0.0%	0.999
Smile		(n=951)	(n=1,277)		(n=130)	(n=2,098)	
	Abnormal	0.5%	0.9%	0.387	0.0%	0.8%	0.609
Palpebral Fissure		(n=951)	(n=1,277)		(n=130)	(n=2,098)	
	Abnormal	0.9%	0.9%	0.999	0.8%	1.0%	0.999
Balance		(n=951)	(n=1,275)		(n=130)	(n=2,096)	
	Abnormal	0.0%	0.9%	0.010	0.0%	0.5%	0.854
Gag Reflex		(n=951)	(n=1,277)		(n=130)	(n=2,098)	
	Abnormal	0.0%	0.1%	0.999	0.0%	0.0%	0.999
Speech		(n=951)	(n=1,277)		(n=130)	(n=2,098)	
	Abnormal	0.1%	0.5%	0.170	0.8%	0.3%	0.960
Palate and Uvula Movement		(n=951)	(n=1,277)		(n=130)	(n=2,098)	
	Deviated	0.0%	0.1%	0.999	0.0%	0.0%	0.999
Neck Range of Motion		(n=950)	(n=1,277)		(n=130)	(n=2,097)	
	Abnormal	5.7%	20.4%	<0.001	6.2%	14.6%	0.011
Cranial Nerve Index without Range of Motion		(n=950)	(n=1,271)		(n=130)	(n=2,091)	
	Abnormal	2.4%	5.1%	0.002	2.3%	4.1%	0.444

Table G-1-1. (Continued)
Dependent Variable-Covariate Associations for the Neurology Assessment

Dependent Variable	Level	Occupation			p-Value
		Officer	Enlisted Flyer	Enlisted Groundcrew	
Medical Records:					
Historical Neurological Disorders					
Inflammatory Disease	Abnormal	(n=864) 0.3%	(n=362) 0.6%	(n=992) 0.3%	0.791
Hereditary and Degenerative Diseases	Abnormal	(n=867) 4.7%	(n=365) 6.6%	(n=995) 5.4%	0.416
Peripheral Disorders	Abnormal	(n=865) 16.8%	(n=363) 17.6%	(n=994) 15.5%	0.583
Other Neurological Disorders	Abnormal	(n=865) 8.3%	(n=364) 30.5%	(n=989) 26.4%	<0.001
Physical Examination:					
Cranial Nerve Function					
Smell	Abnormal	(n=868) 1.5%	(n=365) 1.6%	(n=995) 1.2%	0.783
Visual Fields	Abnormal	(n=867) 0.2%	(n=365) 0.0%	(n=990) 0.2%	0.667
Light Reaction	Abnormal	(n=868) 0.3%	(n=365) 0.3%	(n=992) 0.4%	0.936
Ocular Movement	Abnormal	(n=868) 0.8%	(n=365) 0.3%	(n=992) 0.5%	0.484
Facial Sensation	Abnormal	(n=868) 0.0%	(n=365) 0.3%	(n=995) 0.3%	0.277
Jaw Clench	Deviated	(n=868) 0.0%	(n=365) 0.0%	(n=995) 0.1%	0.538
Smile	Abnormal	(n=868) 1.2%	(n=365) 0.3%	(n=995) 0.6%	0.199
Palpebral Fissure	Abnormal	(n=868) 1.0%	(n=365) 0.8%	(n=995) 0.9%	0.925
Balance	Abnormal	(n=866) 0.5%	(n=365) 0.8%	(n=995) 0.4%	0.610
Gag Reflex	Abnormal	(n=868) 0.0%	(n=365) 0.0%	(n=995) 0.1%	0.538
Speech	Abnormal	(n=868) 0.2%	(n=365) 0.3%	(n=995) 0.5%	0.592
Palate and Uvula Movement	Deviated	(n=868) 0.0%	(n=365) 0.0%	(n=995) 0.1%	0.538
Neck Range of Motion	Abnormal	(n=865) 16.8%	(n=365) 17.6%	(n=994) 10.4%	<0.001
Cranial Nerve Index without Range of Motion	Abnormal	(n=865) 4.2%	(n=365) 3.8%	(n=991) 3.8%	0.928

Table G-1-1. (Continued)
Dependent Variable-Covariate Associations for the Neurology Assessment

Dependent Variable	Level	Current Alcohol Use			p-Value
		0-1 Drinks/Day	1-4 Drinks/Day	>4 Drinks/Day	
Medical Records:					
Historical Neurological Disorders					
Inflammatory Disease		--	--	--	--
Hereditary and Degenerative Diseases		--	--	--	--
Peripheral Disorders		--	--	--	--
Other Neurological Disorders		--	--	--	--
Physical Examination:					
Cranial Nerve Function					
Smell		(n=1,741)	(n=400)	(n=59)	
	Abnormal	1.5%	0.8%	1.7%	0.500
Visual Fields		(n=1,737)	(n=398)	(n=59)	
	Abnormal	0.2%	0.0%	0.0%	0.590
Light Reaction		(n=1,739)	(n=399)	(n=59)	
	Abnormal	0.4%	0.3%	0.0%	0.807
Ocular Movement		(n=1,739)	(n=399)	(n=59)	
	Abnormal	0.5%	1.0%	0.0%	0.436
Facial Sensation		(n=1,741)	(n=400)	(n=59)	
	Abnormal	0.2%	0.0%	0.0%	0.590
Jaw Clench		(n=1,741)	(n=400)	(n=59)	
	Deviated	0.1%	0.0%	0.0%	0.876
Smile		(n=1,741)	(n=400)	(n=59)	
	Abnormal	0.9%	0.5%	0.0%	0.598
Palpebral Fissure		(n=1,741)	(n=400)	(n=59)	
	Abnormal	1.1%	0.5%	0.0%	0.409
Balance		(n=1,739)	(n=400)	(n=59)	
	Abnormal	0.5%	0.8%	0.0%	0.652
Gag Reflex		(n=1,741)	(n=400)	(n=59)	
	Abnormal	0.1%	0.0%	0.0%	0.876
Speech		(n=1,741)	(n=400)	(n=59)	
	Abnormal	0.5%	0.0%	0.0%	0.347
Palate and Uvula Movement		(n=1,741)	(n=400)	(n=59)	
	Deviated	0.1%	0.0%	0.0%	0.876
Neck Range of Motion		(n=1,740)	(n=400)	(n=59)	
	Abnormal	13.3%	17.0%	13.6%	0.152
Cranial Nerve Index without Range of Motion		(n=1,736)	(n=398)	(n=59)	
	Abnormal	4.3%	2.8%	1.7%	0.237

Table G-1-1. (Continued)
Dependent Variable-Covariate Associations for the Neurology Assessment

Dependent Variable	Level	Lifetime Alcohol History			p-Value
		0 Drink-years	0-40 Drink-years	>40 Drink-years	
Medical Records:					
Historical Neurological Disorders					
Inflammatory Disease	Yes	(n=132) 0.0%	(n=1,482) 0.4%	(n=562) 0.4%	0.761
Hereditary and Degenerative Diseases	Yes	(n=134) 6.0%	(n=1,486) 4.5%	(n=564) 7.1%	0.060
Peripheral Disorders	Yes	(n=134) 19.4%	(n=1,482) 15.4%	(n=563) 18.1%	0.201
Other Neurological Disorders	Yes	(n=133) 21.1%	(n=1,481) 19.1%	(n=562) 20.6%	0.674
Physical Examination:					
Cranial Nerve Function					
Smell	Abnormal	(n=134) 3.0%	(n=1,487) 1.2%	(n=564) 1.4%	0.238
Visual Fields	Abnormal	(n=134) 0.7%	(n=1,483) 0.1%	(n=562) 0.2%	0.285
Light Reaction	Abnormal	(n=134) 0.7%	(n=1,485) 0.3%	(n=563) 0.5%	0.512
Ocular Movement	Abnormal	(n=134) 0.0%	(n=1,485) 0.7%	(n=563) 0.5%	0.609
Facial Sensation	Abnormal	(n=134) 0.7%	(n=1,487) 0.1%	(n=564) 0.4%	0.115
Jaw Clench	Deviated	(n=134) 0.0%	(n=1,487) 0.0%	(n=564) 0.2%	0.237
Smile	Abnormal	(n=134) 1.5%	(n=1,487) 0.7%	(n=564) 0.7%	0.622
Palpebral Fissure	Abnormal	(n=134) 2.2%	(n=1,487) 0.9%	(n=564) 0.9%	0.294
Balance	Abnormal	(n=134) 0.7%	(n=1,485) 0.5%	(n=564) 0.4%	0.801
Gag Reflex	Abnormal	(n=134) 0.0%	(n=1,487) 0.0%	(n=564) 0.2%	0.237
Speech	Abnormal	(n=134) 0.0%	(n=1,487) 0.4%	(n=564) 0.4%	0.759
Palate and Uvula Movement	Deviated	(n=134) 0.0%	(n=1,487) 0.0%	(n=564) 0.2%	0.237
Neck Range of Motion	Abnormal	(n=134) 12.7%	(n=1,486) 12.9%	(n=564) 17.0%	0.047
Cranial Nerve Index without Range of Motion	Abnormal	(n=134) 9.0%	(n=1,482) 3.6%	(n=562) 3.7%	0.010

Table G-1-1. (Continued)
Dependent Variable-Covariate Associations for the Neurology Assessment

Dependent Variable	Level	Insecticide Exposure			Industrial Chemical Exposure		
		No	Yes	p-Value	No	Yes	p-Value
Medical Records:							
Historical Neurological Disorders							
Inflammatory Diseases	Yes	(n=700)	(n=1,518)	0.457	(n=916)	(n=1,302)	0.563
		0.6%	0.3%		0.2%	0.5%	
Hereditary and Degenerative Diseases	Yes	(n=702)	(n=1,525)	0.419	(n=919)	(n=1,308)	0.790
		6.0%	5.0%		5.5%	5.2%	
Peripheral Disorders	Yes	(n=702)	(n=1,520)	0.001	(n=918)	(n=1,304)	0.270
		12.5%	18.1%		15.3%	17.1%	
Other Neurological Disorders	Yes	(n=700)	(n=1,518)	0.325	(n=918)	(n=1,300)	0.001
		18.7%	20.6%		16.7%	22.4%	
Physical Examination:							
Cranial Nerve Function							
Smell	Abnormal	(n=702)	(n=1,526)	0.377	(n=920)	(n=1,308)	0.532
		1.0%	1.6%		1.6%	1.2%	
Visual Fields	Abnormal	(n=701)	(n=1,521)	0.999	(n=917)	(n=1,305)	0.999
		0.1%	0.2%		0.2%	0.2%	
Light Reaction	Abnormal	(n=702)	(n=1,523)	0.435	(n=919)	(n=1,306)	0.999
		0.1%	0.5%		0.3%	0.4%	
Ocular Movement	Abnormal	(n=702)	(n=1,523)	0.338	(n=919)	(n=1,306)	0.523
		0.3%	0.7%		0.8%	0.5%	
Facial Sensation	Abnormal	(n=702)	(n=1,526)	0.999	(n=920)	(n=1,308)	0.999
		0.1%	0.2%		0.2%	0.2%	
Jaw Clench	Deviated	(n=702)	(n=1,526)	0.691	(n=920)	(n=1,308)	0.860
		0.1%	0.0%		0.1%	0.0%	
Smile	Abnormal	(n=702)	(n=1,526)	0.999	(n=920)	(n=1,308)	0.220
		0.7%	0.8%		1.1%	0.5%	
Palpebral Fissure	Abnormal	(n=702)	(n=1,526)	0.999	(n=920)	(n=1,308)	0.415
		1.0%	0.9%		1.2%	0.8%	
Balance	Abnormal	(n=702)	(n=1,524)	0.528	(n=918)	(n=1,308)	0.999
		0.3%	0.6%		0.5%	0.5%	
Gag Reflex	Abnormal	(n=702)	(n=1,526)	0.691	(n=920)	(n=1,308)	0.860
		0.1%	0.0%		0.1%	0.0%	
Speech	Abnormal	(n=702)	(n=1,526)	0.999	(n=920)	(n=1,308)	0.114
		0.4%	0.3%		0.7%	0.2%	
Palate and Uvula Movement	Deviated	(n=702)	(n=1,526)	0.691	(n=920)	(n=1,308)	0.860
		0.1%	0.0%		0.1%	0.0%	
Neck Range of Motion	Abnormal	(n=702)	(n=1,525)	0.473	(n=919)	(n=1,308)	0.049
		13.2%	14.5%		15.9%	12.8%	
Cranial Nerve Index without Range of Motion	Abnormal	(n=702)	(n=1,519)	0.029	(n=916)	(n=1,305)	0.070
		2.6%	4.6%		4.9%	3.3%	

Table G-1-1. (Continued)
Dependent Variable-Covariate Associations for the Neurology Assessment

Dependent Variable	Level	Degreasing Chemical Exposure			Diabetic Class			
		No	Yes	p-Value	Normal	Impaired	Diabetic	p-Value
Medical Records:								
Historical Neurological Disorders								
Inflammatory Diseases	Yes	(n=821) 0.1%	(n=1,397) 0.5%	0.284	(n=1,640) 0.4%	(n=250) 0.4%	(n=325) 0.3%	0.982
Hereditary and Degenerative Diseases	Yes	(n=823) 6.2%	(n=1,404) 4.8%	0.203	(n=1,647) 4.9%	(n=251) 7.2%	(n=326) 6.4%	0.202
Peripheral Disorders	Yes	(n=823) 14.2%	(n=1,399) 17.6%	0.044	(n=1,644) 14.3%	(n=251) 17.9%	(n=324) 25.6%	<0.001
Other Neurological Disorders	Yes	(n=819) 16.7%	(n=1,399) 21.9%	0.004	(n=1,640) 18.1%	(n=249) 24.1%	(n=326) 26.4%	0.001
Physical Examination:								
Cranial Nerve Function								
Smell	Abnormal	(n=823) 1.5%	(n=1,405) 1.4%	0.985	(n=1,648) 1.2%	(n=251) 1.2%	(n=326) 2.5%	0.209
Visual Fields	Abnormal	(n=821) 0.4%	(n=1,401) 0.1%	0.289	(n=1,645) 0.2%	(n=251) 0.0%	(n=323) 0.3%	0.686
Light Reaction	Abnormal	(n=823) 0.4%	(n=1,402) 0.4%	0.999	(n=1,647) 0.3%	(n=251) 0.0%	(n=324) 0.9%	0.139
Ocular Movement	Abnormal	(n=823) 0.6%	(n=1,405) 0.6%	0.999	(n=1,647) 0.5%	(n=251) 1.2%	(n=324) 0.6%	0.388
Facial Sensation	Abnormal	(n=823) 0.1%	(n=1,405) 0.2%	0.999	(n=1,648) 0.1%	(n=251) 0.4%	(n=326) 0.3%	0.529
Jaw Clench	Deviated	(n=823) 0.0%	(n=1,405) 0.1%	0.999	(n=1,648) 0.0%	(n=251) 0.4%	(n=326) 0.0%	0.020
Smile	Abnormal	(n=823) 0.6%	(n=1,405) 0.9%	0.694	(n=1,648) 0.7%	(n=251) 0.4%	(n=326) 1.5%	0.203
Palpebral Fissure	Abnormal	(n=823) 1.0%	(n=1,405) 0.9%	0.999	(n=1,648) 0.8%	(n=251) 0.8%	(n=326) 1.5%	0.490
Balance	Abnormal	(n=822) 0.5%	(n=1,404) 0.5%	0.999	(n=1,647) 0.2%	(n=251) 0.4%	(n=325) 2.2%	<0.001
Gag Reflex	Abnormal	(n=823) 0.0%	(n=1,405) 0.1%	0.999	(n=1,648) 0.0%	(n=251) 0.4%	(n=326) 0.0%	0.020
Speech	Abnormal	(n=823) 0.5%	(n=1,405) 0.3%	0.689	(n=1,648) 0.3%	(n=251) 0.8%	(n=326) 0.3%	0.470
Palate and Uvula Movement	Deviated	(n=823) 0.0%	(n=1,405) 0.1%	0.999	(n=1,648) 0.0%	(n=251) 0.4%	(n=326) 0.0%	0.020
Neck Range of Motion	Abnormal	(n=823) 14.8%	(n=1,404) 13.7%	0.491	(n=1,647) 13.4%	(n=251) 15.1%	(n=326) 16.6%	0.287
Cranial Nerve Index without Range of Motion	Abnormal	(n=820) 3.9%	(n=1,401) 4.0%	0.999	(n=1,645) 3.5%	(n=251) 2.8%	(n=322) 7.5%	0.002

Table G-1-1. (Continued)
Dependent Variable-Covariate Associations for the Neurology Assessment

Dependent Variable	Level	Serum Insulin		
		No	Abnormal	p-Value
Medical Records:				
Historical Neurological Disorders				
Inflammatory Disease		--	--	--
Hereditary and Degenerative Diseases		--	--	--
Peripheral Disorders		--	--	--
Other Neurological Disorders		--	--	--
Physical Examination:				
Cranial Nerve Function				
Smell		(n=983)	(n=1,243)	
	Abnormal	1.5%	1.3%	0.768
Visual Fields		(n=979)	(n=1,241)	
	Abnormal	0.3%	0.1%	0.458
Light Reaction		(n=981)	(n=1,242)	
	Abnormal	0.4%	0.3%	0.999
Ocular Movement		(n=981)	(n=1,242)	
	Abnormal	0.4%	0.7%	0.488
Facial Sensation		(n=983)	(n=1,243)	
	Abnormal	0.0%	0.3%	0.202
Jaw Clench		(n=983)	(n=1,243)	
	Deviated	0.0%	0.1%	0.999
Smile		(n=983)	(n=1,243)	
	Abnormal	0.9%	0.6%	0.626
Palpebral Fissure		(n=983)	(n=1,243)	
	Abnormal	1.2%	0.7%	0.326
Balance		(n=983)	(n=1,241)	
	Abnormal	0.6%	0.4%	0.698
Gag Reflex		(n=983)	(n=1,243)	
	Abnormal	0.0%	0.1%	0.999
Speech		(n=983)	(n=1,243)	
	Abnormal	0.2%	0.5%	0.461
Palate and Uvula Movement		(n=983)	(n=1,243)	
	Deviated	0.0%	0.1%	0.999
Neck Range of Motion		(n=983)	(n=1,242)	
	Abnormal	13.3%	14.7%	0.376
Cranial Nerve Index without Range of Motion		(n=979)	(n=1,240)	
	Abnormal	3.9%	4.0%	0.943

Table G-1-1. (Continued)
Dependent Variable-Covariate Associations for the Neurology Assessment

Dependent Variable	Level	Age			Race		
		Born ≥1942	Born <1942	p-Value	Black	Non-Black	p-Value
Physical Examination:							
Peripheral Nerve Function							
Pin Prick		(n=936)	(n=1,189)		(n=126)	(n=1,999)	
	Abnormal	4.0%	6.6%	0.009	3.2%	5.6%	0.336
Light Touch		(n=936)	(n=1,189)		(n=126)	(n=1,999)	
	Abnormal	3.0%	5.5%	0.008	2.4%	4.5%	0.366
Muscle Status		(n=950)	(n=1,276)		(n=130)	(n=2,096)	
	Abnormal	1.8%	3.8%	0.009	0.0%	3.1%	0.077
Patellar Reflex		(n=948)	(n=1,274)		(n=129)	(n=2,093)	
	Abnormal	0.4%	3.2%	<0.001	1.6%	2.1%	0.942
Achilles Reflex		(n=944)	(n=1,270)		(n=129)	(n=2,085)	
	Abnormal	4.4%	13.1%	<0.001	10.1%	9.4%	0.920
Biceps Reflex		(n=951)	(n=1,277)		(n=130)	(n=2,098)	
	Abnormal	0.4%	1.3%	0.048	0.8%	1.0%	0.999
Babinski Reflex		(n=951)	(n=1,275)		(n=130)	(n=2,096)	
	Abnormal	0.4%	0.5%	0.903	0.8%	0.5%	0.999
Vibrotactile Threshold							
Measurement of Right Great Toe (microns) ^a		(n=2,223)			(n=129)	(n=2,094)	
		r=0.385		<0.001	\bar{x} =14.74	\bar{x} =16.75	0.221
Vibrotactile Threshold							
Measurement of Left Great Toe (microns) ^a		(n=2,283)			(n=129)	(n=2,094)	
		r=0.420		<0.001	\bar{x} =13.23	\bar{x} =16.96	0.019
Physical Examination: CNS							
Coordination Processes							
Tremor		(n=951)	(n=1,277)		(n=130)	(n=2,098)	
	Abnormal	2.4%	3.1%	0.440	1.5%	2.9%	0.539
Coordination		(n=950)	(n=1,275)		(n=130)	(n=2,095)	
	Abnormal	0.8%	3.0%	0.001	1.5%	2.1%	0.905
Romberg Sign		(n=951)	(n=1,275)		(n=130)	(n=2,096)	
	Abnormal	0.0%	0.9%	0.010	0.0%	0.5%	0.854
Gait		(n=951)	(n=1,276)		(n=130)	(n=2,097)	
	Abnormal	2.3%	4.0%	0.037	2.3%	3.3%	0.699
Central Nervous System Index		(n=950)	(n=1,276)		(n=130)	(n=2,096)	
	Abnormal	4.5%	7.0%	0.020	2.3%	6.2%	0.107

^a Means transformed from natural logarithm scale; correlations based on natural logarithm of dependent variable versus covariate.

Note: Correlations (r) are based on total sample size and are not category specific.

Table G-1-1. (Continued)
Dependent Variable-Covariate Associations for the Neurology Assessment

Dependent Variable	Level	Occupation			p-Value
		Officer	Enlisted Flyer	Enlisted Groundcrew	
Physical Examination: Peripheral Nerve Function					
Pin Prick		(n=821)	(n=351)	(n=953)	
	Abnormal	5.5%	7.1%	4.8%	0.270
Light Touch		(n=821)	(n=351)	(n=953)	
	Abnormal	4.4%	4.3%	4.4%	0.994
Muscle Status		(n=868)	(n=363)	(n=995)	
	Abnormal	2.6%	4.1%	2.7%	0.324
Patellar Reflex		(n=865)	(n=363)	(n=994)	
	Abnormal	2.2%	2.2%	1.8%	0.812
Achilles Reflex		(n=864)	(n=361)	(n=989)	
	Abnormal	10.5%	10.2%	8.2%	0.193
Biceps Reflex		(n=868)	(n=365)	(n=995)	
	Abnormal	1.3%	0.5%	0.8%	0.408
Babinski Reflex		(n=867)	(n=364)	(n=995)	
	Abnormal	0.3%	0.5%	0.6%	0.723
Vibrotactile Threshold Measurement of Right Great Toe (microns) ^a					
		(n=865) \bar{x} =17.81	(n=365) \bar{x} =19.68	(n=993) \bar{x} =14.72	<0.001
Vibrotactile Threshold Measurement of Left Great Toe (microns) ^a					
		(n=866) \bar{x} =18.03	(n=364) \bar{x} =20.19	(n=993) \bar{x} =14.61	<0.001
Physical Examination: CNS Coordination Processes					
Tremor		(n=868)	(n=365)	(n=995)	
	Abnormal	3.2%	2.2%	2.6%	0.547
Coordination		(n=867)	(n=363)	(n=995)	
	Abnormal	2.2%	1.9%	2.0%	0.943
Romberg Sign		(n=866)	(n=365)	(n=995)	
	Abnormal	0.5%	0.8%	0.4%	0.610
Gait		(n=867)	(n=365)	(n=995)	
	Abnormal	2.9%	4.1%	3.3%	0.542
Central Nervous System Index		(n=867)	(n=364)	(n=995)	
	Abnormal	5.7%	6.6%	5.9%	0.816

^a Means transformed from natural logarithm scale; correlations based on natural logarithm of dependent variable versus covariate.

Table G-1-1. (Continued)
Dependent Variable-Covariate Associations for the Neurology Assessment

Dependent Variable	Level	Current Alcohol Use			p-Value
		0-1 Drinks/Day	1-4 Drinks/Day	>4 Drinks/Day	
Physical Examination:					
Peripheral Nerve Function					
Pin Prick	Abnormal	(n=1,656) 5.4%	(n=389) 5.9%	(n=56) 5.4%	0.915
Light Touch	Abnormal	(n=1,656) 4.0%	(n=389) 5.9%	(n=56) 5.4%	0.232
Muscle Status	Abnormal	(n=1,739) 3.1%	(n=400) 2.0%	(n=59) 5.1%	0.310
Patellar Reflex	Abnormal	(n=1,736) 1.7%	(n=399) 3.0%	(n=59) 1.7%	0.248
Achilles Reflex	Abnormal	(n=1,727) 9.3%	(n=400) 8.8%	(n=59) 15.3%	0.274
Biceps Reflex	Abnormal	(n=1,741) 0.9%	(n=400) 1.3%	(n=59) 1.7%	0.647
Babinski Reflex	Abnormal	(n=1,739) 0.6%	(n=400) 0.2%	(n=59) 0.0%	0.608
Vibrotactile Threshold Measurement of Right Great Toe (microns) ^a			(n=2,196) r=0.040		0.062
Vibrotactile Threshold Measurement of Left Great Toe (microns) ^a			(n=2,196) r=0.051		0.017
Physical Examination: CNS					
Coordination Processes					
Tremor	Abnormal	(n=1,741) 2.5%	(n=400) 3.5%	(n=59) 5.1%	0.276
Coordination	Abnormal	(n=1,738) 2.0%	(n=400) 2.5%	(n=59) 0.0%	0.438
Romberg Sign	Abnormal	(n=1,739) 0.5%	(n=400) 0.8%	(n=59) 0.0%	0.652
Gait	Abnormal	(n=1,740) 3.2%	(n=400) 3.7%	(n=59) 3.4%	0.836
Central Nervous System Index	Abnormal	(n=1,739) 5.5%	(n=400) 7.0%	(n=59) 8.5%	0.362

^a Means transformed from natural logarithm scale; correlations based on natural logarithm of dependent variable versus covariate.

Note: Correlations (r) are based on total sample size and are not category specific.

Table G-1-1. (Continued)
Dependent Variable-Covariate Associations for the Neurology Assessment

Dependent Variable	Level	Lifetime Alcohol History			p-Value
		0 Drink-years	0-40 Drink-years	>40 Drink-years	
Physical Examination: Peripheral Nerve Function					
Pin Prick		(n=128)	(n=1,422)	(n=538)	0.315
	Abnormal	6.2%	5.0%	6.7%	
Light Touch		(n=128)	(n=1,422)	(n=538)	0.573
	Abnormal	3.9%	4.1%	5.2%	
Muscle Status		(n=134)	(n=1,485)	(n=564)	0.269
	Abnormal	0.7%	3.0%	3.4%	
Patellar Reflex		(n=134)	(n=1,482)	(n=563)	0.057
	Abnormal	3.0%	1.5%	3.0%	
Achilles Reflex		(n=133)	(n=1,475)	(n=563)	0.223
	Abnormal	11.3%	8.6%	10.8%	
Biceps Reflex		(n=134)	(n=1,487)	(n=564)	0.723
	Abnormal	0.7%	0.9%	1.2%	
Babinski Reflex		(n=134)	(n=1,485)	(n=564)	0.696
	Abnormal	0.0%	0.5%	0.5%	
Vibrotactile Threshold Measurement of Right Great Toe (microns) ^a			(n=2,181) r=0.073		<0.001
Vibrotactile Threshold Measurement of Left Great Toe (microns) ^a			(n=2,181) r=0.089		<0.001
Physical Examination: CNS Coordination Processes					
Tremor		(n=134)	(n=1,487)	(n=564)	0.015
	Abnormal	1.5%	2.2%	4.4%	
Coordination		(n=134)	(n=1,484)	(n=564)	0.517
	Abnormal	0.7%	2.1%	2.3%	
Romberg Sign		(n=134)	(n=1,485)	(n=564)	0.801
	Abnormal	0.7%	0.5%	0.4%	
Gait		(n=134)	(n=1,486)	(n=564)	0.183
	Abnormal	3.7%	2.8%	4.4%	
Central Nervous System Index		(n=134)	(n=1,485)	(n=564)	0.030
	Abnormal	4.5%	5.2%	8.2%	

^a Means transformed from natural logarithm scale; correlations based on natural logarithm of dependent variable versus covariate.

Note: Correlations (r) are based on total sample size and are not category specific.

Table G-1-1. (Continued)
Dependent Variable-Covariate Associations for the Neurology Assessment

Dependent Variable	Level	Insecticide Exposure			Industrial Chemical Exposure		
		No	Yes	p-Value	No	Yes	p-Value
Physical Examination:							
Peripheral Nerve Function							
Pin Prick		(n=676)	(n=1,449)		(n=877)	(n=1,248)	
	Abnormal	5.0%	5.7%	0.622	5.1%	5.7%	0.645
Light Touch		(n=676)	(n=1,449)		(n=877)	(n=1,248)	
	Abnormal	4.4%	4.3%	0.999	3.8%	4.8%	0.293
Muscle Status		(n=701)	(n=1,525)		(n=920)	(n=1,306)	
	Abnormal	2.3%	3.2%	0.282	3.2%	2.8%	0.676
Patellar Reflex		(n=701)	(n=1,521)		(n=919)	(n=1,303)	
	Abnormal	2.1%	2.0%	0.922	2.6%	1.6%	0.135
Achilles Reflex		(n=699)	(n=1,515)		(n=918)	(n=1,296)	
	Abnormal	8.6%	9.8%	0.391	10.0%	9.0%	0.475
Biceps Reflex		(n=702)	(n=1,526)		(n=920)	(n=1,308)	
	Abnormal	1.1%	0.9%	0.677	1.4%	0.6%	0.088
Babinski Reflex		(n=701)	(n=1,525)		(n=920)	(n=1,306)	
	Abnormal	0.9%	0.3%	0.185	0.3%	0.6%	0.521
Vibrotactile Threshold Measurement of Right Great Toe (microns) ^a							
		(n=701) \bar{x} =16.25	(n=1,522) \bar{x} =16.81	0.519	(n=917) \bar{x} =17.63	(n=1,306) \bar{x} =15.96	0.046
Vibrotactile Threshold Measurement of Left Great Toe (microns) ^a							
		(n=700) \bar{x} =15.77	(n=1,523) \bar{x} =17.18	0.109	(n=917) \bar{x} =17.18	(n=1,306) \bar{x} =16.41	0.362
Physical Examination: CNS							
Coordination Processes							
Tremor		(n=702)	(n=1,526)		(n=920)	(n=1,308)	
	Abnormal	3.3%	2.6%	0.411	3.4%	2.4%	0.200
Coordination		(n=701)	(n=1,524)		(n=919)	(n=1,306)	
	Abnormal	2.0%	2.1%	0.999	2.5%	1.8%	0.290
Romberg Sign		(n=702)	(n=1,524)		(n=918)	(n=1,308)	
	Abnormal	0.3%	0.6%	0.528	0.5%	0.5%	0.999
Gait		(n=702)	(n=1,525)		(n=919)	(n=1,308)	
	Abnormal	3.7%	3.1%	0.524	3.4%	3.2%	0.928
Central Nervous System Index		(n=702)	(n=1,524)		(n=919)	(n=1,307)	
	Abnormal	6.7%	5.6%	0.347	6.5%	5.5%	0.362

^a Means transformed from natural logarithm scale; correlations based on natural logarithm of dependent variable versus covariate.

Table G-1-1. (Continued)
Dependent Variable-Covariate Associations for the Neurology Assessment

Dependent Variable	Level	Degreasing Chemical Exposure			Diabetic Class			
		No	Yes	p-Value	Normal	Impaired	Diabetic	p-Value
Physical Examination:								
Peripheral Nerve Function								
Pin Prick	Abnormal	(n=787)	(n=1,338)	0.280	(n=1,603)	(n=234)	(n=286)	<0.001
		4.7%	5.9%		4.3%	6.8%	10.8%	
Light Touch	Abnormal	(n=787)	(n=1,338)	0.127	(n=1,603)	(n=234)	(n=286)	0.001
		3.4%	4.9%		4.3%	6.8%	10.8%	
Muscle Status	Abnormal	(n=822)	(n=1,404)	0.897	(n=1,648)	(n=250)	(n=325)	0.371
		3.0%	2.8%		2.6%	3.2%	4.0%	
Patellar Reflex	Abnormal	(n=821)	(n=1,401)	0.559	(n=1,643)	(n=250)	(n=326)	<0.001
		2.3%	1.9%		1.4%	0.8%	6.1%	
Achilles Reflex	Abnormal	(n=820)	(n=1,394)	0.171	(n=1,636)	(n=250)	(n=325)	<0.001
		10.6%	8.8%		7.0%	10.4%	20.9%	
Biceps Reflex	Abnormal	(n=823)	(n=1,405)	0.736	(n=1,648)	(n=251)	(n=326)	0.009
		1.1%	0.9%		0.7%	0.8%	2.5%	
Babinski Reflex	Abnormal	(n=822)	(n=1,404)	0.784	(n=1,647)	(n=250)	(n=326)	0.891
		0.6%	0.4%		0.4%	0.4%	0.6%	
Vibrotactile Threshold Measurement of Right Great Toe (microns) ^a								
		(n=820)	(n=1,403)	0.189	(n=1,646)	(n=251)	(n=323)	<0.001
		$\bar{x}=17.34$	$\bar{x}=16.23$		$\bar{x}=15.51$	$\bar{x}=17.26$	$\bar{x}=22.84$	
Vibrotactile Threshold Measurement of Left Great Toe (microns) ^a								
		(n=821)	(n=1,402)	0.278	(n=1,647)	(n=250)	(n=323)	<0.001
		$\bar{x}=17.32$	$\bar{x}=16.38$		$\bar{x}=15.35$	$\bar{x}=19.20$	$\bar{x}=23.08$	
Physical Examination: CNS Coordination Processes								
Tremor	Abnormal	(n=823)	(n=1,405)	0.915	(n=1,648)	(n=251)	(n=326)	0.921
		2.7%	2.8%		2.7%	2.8%	3.1%	
Coordination	Abnormal	(n=821)	(n=1,404)	0.999	(n=1,648)	(n=250)	(n=324)	0.127
		2.1%	2.1%		1.7%	2.4%	3.4%	
Romberg Sign	Abnormal	(n=822)	(n=1,404)	0.999	(n=1,647)	(n=251)	(n=325)	<0.001
		0.5%	0.5%		0.2%	0.4%	2.2%	
Gait	Abnormal	(n=823)	(n=1,404)	0.906	(n=1,647)	(n=251)	(n=326)	0.128
		3.2%	3.3%		2.8%	4.8%	4.3%	
Central Nervous System Index	Abnormal	(n=821)	(n=1,405)	0.826	(n=1,648)	(n=251)	(n=324)	0.071
		5.7%	6.0%		5.2%	7.6%	8.0%	

^a Means transformed from natural logarithm scale; correlations based on natural logarithm of dependent variable versus covariate.

Table G-1-1. (Continued)
Dependent Variable-Covariate Associations for the Neurology Assessment

Dependent Variable	Level	Serum Insulin		
		No	Abnormal	p-Value
Physical Examination:				
Peripheral Nerve Function				
Pin Prick		(n=953)	(n=1,170)	
	Abnormal	5.9%	5.1%	0.510
Light Touch		(n=953)	(n=1,170)	
	Abnormal	4.9%	3.9%	0.311
Muscle Status		(n=983)	(n=1,241)	
	Abnormal	3.0%	2.9%	0.999
Patellar Reflex		(n=979)	(n=1,241)	
	Abnormal	2.3%	1.8%	0.421
Achilles Reflex		(n=976)	(n=1,236)	
	Abnormal	9.0%	9.8%	0.586
Biceps Reflex		(n=983)	(n=1,243)	
	Abnormal	0.9%	1.0%	0.999
Babinski Reflex		(n=982)	(n=1,242)	
	Abnormal	0.5%	0.5%	0.999
Vibrotactile Threshold Measurement of Right Great Toe (microns) ^a		(n=2,221)		
		r=0.011		0.598
Vibrotactile Threshold Measurement of Left Great Toe (microns) ^a		(n=2,221)		
		r=0.029		0.175
Physical Examination: CNS				
Coordination Processes				
Tremor		(n=986)	(n=1,243)	
	Abnormal	3.1%	2.6%	0.582
Coordination		(n=983)	(n=1,240)	
	Abnormal	1.6%	2.4%	0.249
Romberg Sign		(n=983)	(n=1,241)	
	Abnormal	0.6%	0.4%	0.698
Gait		(n=983)	(n=1,242)	
	Abnormal	3.5%	3.1%	0.765
Central Nervous System Index		(n=983)	(n=1,241)	
	Abnormal	6.2%	5.7%	0.697

^a Means transformed from natural logarithm scale; correlations based on natural logarithm of dependent variable versus covariate.

Note: Correlations (r) are based on total sample size and are not category specific.

Table G-1-1. (Continued)
Dependent Variable-Covariate Associations for the Neurology Assessment

	Composite Exposure to Heavy Metals			Worked With Vibrating Power Equipment or Tools		
	No	Abnormal	p-Value	No	Abnormal	p-Value
Physical Examination:						
Peripheral Nerve Function						
Vibrotactile Measurement of Right Great Toe (microns) ^a	(n=1,875) \bar{x} =16.73	(n=346) \bar{x} =16.10	0.572	(n=1,726) \bar{x} =16.72	(n=495) \bar{x} =16.30	0.663
Vibrotactile Measurement of Left Great Toe (microns) ^a	(n=1,875) \bar{x} =16.73	(n=346) \bar{x} =16.66	0.949	(n=1,726) \bar{x} =16.91	(n=495) \bar{x} =16.08	0.398

^a Means transformed from natural logarithm scale; correlations based on natural logarithm of dependent variable versus covariate.

APPENDIX G-2.

Interaction Tables for the Neurology Assessment

This appendix contains exposure analyses results of interactions between covariates and group or dioxin. Results are presented for separate strata of the covariate and include sample sizes, percent abnormal, relative risks, confidence intervals, and p-values for discrete dependent variables. Sample sizes, adjusted means, differences of adjusted means and confidence intervals or adjusted slopes and standard errors, and p-values are given for continuous dependent variables. Means are transformed back to the original scale, if necessary. Chapter 7, Statistical Methods, provides further details on the analytical approaches used in the interaction analyses. The covariate involved in the interaction and a reference to the analysis table in Chapter 11 are given in the heading of each subtable. A summary of the interactions described in this appendix follows.

Appendix G-2 Table	Chapter 11 Table	Dependent Variable	Model	Covariate
G-2-1	11-4	Hereditary and Degenerative Diseases	2	Occupation
G-2-2	11-5	Peripheral Disorders	4 5 6	Lifetime Alcohol History Lifetime Alcohol History Lifetime Alcohol History
G-2-3	11-7	Smell	3	Insecticide Exposure
G-2-4	11-19	Neck Range of Motion	3	Occupation
G-2-5	11-20	Cranial Nerve Index without Range of Motion	2 3	Age, Diabetic Class Occupation
G-2-6	11-21	Pin Prick	4 5 6	Diabetic Class Diabetic Class Diabetic Class
G-2-7	11-23	Muscle Status	3	Insecticide Exposure
G-2-8	11-24	Patellar Reflex	1 3	Lifetime Alcohol History Lifetime Alcohol History
G-2-9	11-25	Achilles Reflex	2 3	Lifetime Alcohol History Lifetime Alcohol History
G-2-10	11-28	Vibrotactile Threshold Measurement of Right Great Toe	2 3 4 5 6	Composite Exposure to Heavy Metals Lifetime Alcohol History Lifetime Alcohol History, Composite Exposure to Heavy Metals Lifetime Alcohol History, Composite Exposure to Heavy Metals Lifetime Alcohol History, Composite Exposure to Heavy Metals

Appendix G-2 Table	Chapter 11 Table	Dependent Variable	Model	Covariate
G-2-11	11-29	Vibrotactile Threshold Measurement of Left Great Toe	2	Diabetic Class, Composite Exposure to Heavy Metals
			4	Lifetime Alcohol History, Diabetic Class, Worked with Vibrating Power Equipment or Tools
			5	Lifetime Alcohol History, Worked with Vibrating Power Equipment or Tools
			6	Lifetime Alcohol History, Worked with Vibrating Power Equipment or Tools
G-2-12	11-30	Tremor	4	Age
G-2-13	11-33	Gait	2	Age

Table G-2-1.
Interaction Table for Hereditary and Degenerative Diseases

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Occupation: Table 11-4)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log_e (Initial Dioxin)	
Stratum	Initial Dioxin	n	Percent Yes	Adjusted Relative Risk (95% C.I.)^a	p-Value
Officer	Low	76	5.3	0.90 (0.18,4.52)	0.897
	Medium	34	2.9		
	High	1	0.0		
Enlisted Flyer	Low	36	13.9	0.17 (0.03,0.85)	0.031
	Medium	43	0.0		
	High	29	0.0		
Enlisted Groundcrew	Low	59	3.4	1.00 (0.68,1.49)	0.986
	Medium	91	5.5		
	High	135	5.9		

^a Relative risk for a twofold increase in initial dioxin.

Note: Low = 39-98 ppt; Medium = > 98-232 ppt; High = > 232 ppt.

Table G-2-2.
Interaction Table for Peripheral Disorders

a) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Lifetime Alcohol History: Table 11-5)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent Yes	Adjusted Relative Risk (95% C.I.) ^a	p-Value
0 Drink-years	Low	17	5.9	1.44 (0.89,2.31)	0.135
	Medium	18	22.2		
	High	24	20.8		
> 0-40 Drink-years	Low	204	10.3	1.21 (1.01,1.45)	0.038
	Medium	195	20.0		
	High	190	19.5		
> 40 Drink-years	Low	67	22.4	0.82 (0.63,1.07)	0.148
	Medium	78	24.4		
	High	73	15.1		

b) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Lifetime Alcohol History: Table 11-5)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent Yes	Adjusted Relative Risk (95% C.I.) ^a	p-Value
0 Drink-years	Low	18	5.6	1.33 (0.87,2.02)	0.188
	Medium	14	21.4		
	High	27	22.2		
> 0-40 Drink-years	Low	205	11.7	1.17 (1.00,1.37)	0.048
	Medium	201	17.9		
	High	183	20.2		
> 40 Drink-years	Low	68	20.6	0.84 (0.69,1.04)	0.107
	Medium	75	25.3		
	High	75	16.0		

Table G-2-2. (Continued)
Interaction Table for Peripheral Disorders

c) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Lifetime Alcohol History: Table 11-5)					
Current Dioxin Category Summary Statistics				Analysis Results for Log _e (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent Yes	Adjusted Relative Risk (95% C.I.) ^a	p-Value
0 Drink-years	Low	18	5.6	1.36 (0.89,2.08)	0.157
	Medium	14	21.4		
	High	27	22.2		
>0-40 Drink-years	Low	205	11.7	1.20 (1.02,1.41)	0.031
	Medium	201	17.9		
	High	183	20.2		
>40 Drink-years	Low	68	20.6	0.86 (0.70,1.07)	0.168
	Medium	75	25.3		
	High	75	16.0		

^a Relative risk for a twofold increase in current dioxin.

Note: Model 4: Low = ≤8.1 ppt; Medium = >8.1-20.5 ppt; High = >20.5 ppt.
 Models 5 and 6: Low = ≤46 ppq; Medium = >46-128 ppq; High = >128 ppq.

**Table G-2-3.
Interaction Table for Smell**

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Insecticide Exposure: Table 11-7)					
Stratum	Dioxin Category	n	Percent Abnormal	Adjusted Relative Risk (95% C.I.) ^a	p-Value
No	Comparison	397	0.5		
	Background RH	92	0.0	--	--
	Low RH	51	5.9	11.03 (1.78,68.34)	0.010
	High RH	67	0.0	--	--
	Low plus High RH	118	2.5	5.07 (0.83,30.87)	0.078
Yes	Comparison	665	1.8		
	Background RH	281	2.9	1.57 (0.63,3.93)	0.335
	Low RH	209	0.5	0.25 (0.03,1.93)	0.184
	High RH	190	0.5	0.32 (0.04,2.54)	0.284
	Low plus High RH	399	0.5	0.28 (0.06,1.28)	0.101

^a Relative risk and confidence interval relative to Comparisons.

--: Adjusted relative risk, confidence interval, and p-value not presented due to the sparse number of abnormalities.

Note: RH = Ranch Hand.

Comparison: Current Dioxin \leq 10 ppt.

Background (Ranch Hand): Current Dioxin \leq 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin \leq 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table G-2-4.
Interaction Table for Neck Range of Motion

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Occupation: Table 11-19)					
Stratum	Dioxin Category	n	Percent Abnormal	Adjusted Relative Risk (95% C.I.)^a	p-Value
Officer	Comparison	408	15.0		
	Background RH	236	17.0	1.28 (0.81,2.02)	0.291
	Low RH	103	21.4	1.35 (0.76,2.39)	0.306
	High RH	9	0.0	--	--
	Low plus High RH	112	19.6	1.20 (0.68,2.12)	0.527
Enlisted Flyer	Comparison	173	19.7		
	Background RH	40	2.5	0.13 (0.02,1.00)	0.050
	Low RH	55	12.7	0.54 (0.22,1.34)	0.185
	High RH	55	21.8	0.99 (0.46,2.15)	0.978
	Low plus High RH	110	17.3	0.76 (0.40,1.44)	0.398
Enlisted Groundcrew	Comparison	481	9.4		
	Background RH	97	9.3	0.90 (0.41,2.00)	0.799
	Low RH	102	11.8	1.11 (0.54,2.29)	0.778
	High RH	192	12.0	1.56 (0.88,2.75)	0.128
	Low plus High RH	294	11.9	1.37 (0.83,2.26)	0.212

^a Relative risk and confidence interval relative to Comparisons.

--: Adjusted relative risk, confidence interval, and p-value not presented due to the sparse number of abnormalities.

Note: RH = Ranch Hand.

Comparison: Current Dioxin \leq 10 ppt.

Background (Ranch Hand): Current Dioxin \leq 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin \leq 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table G-2-5.
Interaction Table for Cranial Nerve Index without Range of Motion

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Age: Table 11-20)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Initial Dioxin)	
Stratum	Initial Dioxin	n	Percent Abnormal	Adjusted Relative Risk (95% C.I.) ^a	p-Value
Born ≥ 1942	Low	55	7.3	0.98 (0.60,1.59)	0.922
	Medium	72	1.4		
	High	109	4.6		
Born < 1942	Low	119	5.0	1.26 (0.83,1.90)	0.280
	Medium	100	3.0		
	High	60	10.0		

b) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Diabetic Class: Table 11-20)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Initial Dioxin)	
Stratum	Initial Dioxin	n	Percent Abnormal	Adjusted Relative Risk (95% C.I.) ^a	p-Value
Normal	Low	120	3.3	1.80 (1.16,2.78)	0.008
	Medium	117	0.0		
	High	108	7.4		
Impaired	Low	22	4.6	0.74 (0.29,1.92)	0.538
	Medium	24	4.2		
	High	28	3.6		
Diabetic	Low	32	15.6	0.66 (0.36,1.23)	0.194
	Medium	31	9.7		
	High	33	6.1		

Table G-2-5. (Continued)
Interaction Table for Cranial Nerve Index without Range of Motion

c) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Occupation: Table 11-20)					
Stratum	Dioxin Category	n	Percent Abnormal	Adjusted Relative Risk (95% C.I.) ^b	p-Value
Officer	Comparison	406	3.9		
	Background RH	236	2.5	0.61 (0.23,1.60)	0.316
	Low RH	102	6.9	1.50 (0.59,3.81)	0.392
	High RH	9	0.0	--	--
	Low plus High RH	111	6.3	1.39 (0.55,3.51)	0.492
Enlisted Flyer	Comparison	173	4.1		
	Background RH	40	2.5	0.70 (0.08,5.91)	0.741
	Low RH	55	5.5	1.10 (0.27,4.48)	0.891
	High RH	55	0.0	--	--
	Low plus High RH	110	2.7	0.55 (0.14,2.18)	0.390
Enlisted Groundcrew	Comparison	478	2.5		
	Background RH	95	9.5	3.63 (1.44,9.10)	0.006
	Low RH	102	3.9	1.42 (0.44,4.55)	0.553
	High RH	192	5.7	2.43 (1.04,5.67)	0.040
	Low plus High RH	294	5.1	2.05 (0.93,4.48)	0.074

^a Relative risk for a twofold increase in initial dioxin.

^b Relative risk and confidence interval relative to Comparisons.

--: Adjusted relative risk, confidence interval, and p-value not presented due to the sparse number of abnormalities.

Note: Model 2: Low = 39-98 ppt; Medium = > 98-232 ppt; High = > 232 ppt.

Model 3: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table G-2-6.
Interaction Table for Pin Prick

a) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Diabetic Class: Table 11-21)					
Current Dioxin Category Summary Statistics				Analysis Results for Log₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent Abnormal	Adjusted Relative Risk (95% C.I.)^a	p-Value
Normal	Low	234	3.0	1.01 (0.71,1.43)	0.950
	Medium	208	7.2		
	High	186	1.6		
Impaired	Low	25	4.0	0.64 (0.34,1.19)	0.156
	Medium	29	10.3		
	High	46	8.7		
Diabetic	Low	25	0.0	2.08 (1.23,3.52)	0.006
	Medium	47	12.8		
	High	51	15.7		

b) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Diabetic Class: Table 11-21)					
Current Dioxin Category Summary Statistics				Analysis Results for Log₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent Abnormal	Adjusted Relative Risk (95% C.I.)^a	p-Value
Normal	Low	246	4.1	1.03 (0.76,1.38)	0.867
	Medium	202	5.0		
	High	180	2.8		
Impaired	Low	21	4.8	0.68 (0.39,1.20)	0.186
	Medium	32	9.4		
	High	47	8.5		
Diabetic	Low	24	0.0	1.78 (1.15,2.77)	0.010
	Medium	45	13.3		
	High	54	14.8		

Table G-2-6. (Continued)
Interaction Table for Pin Prick

c) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Diabetic Class: Table 11-21)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent Abnormal	Adjusted Relative Risk (95% C.I.) ^a	p-Value
Normal	Low	245	4.1	1.05 (0.77,1.43)	0.778
	Medium	202	5.0		
	High	180	2.8		
Impaired	Low	21	4.8	0.70 (0.40,1.24)	0.220
	Medium	32	9.4		
	High	47	8.5		
Diabetic	Low	24	0.0	1.89 (1.18,3.01)	0.008
	Medium	45	13.3		
	High	54	14.8		

^a Relative risk for a twofold increase in current dioxin.

Note: Model 4: Low = ≤ 8.1 ppt; Medium = $> 8.1-20.5$ ppt; High = > 20.5 ppt.
 Models 5 and 6: Low = ≤ 46 ppq; Medium = $> 46-128$ ppq; High = > 128 ppq.

**Table G-2-7.
Interaction Table for Muscle Status**

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Insecticide Exposure: Table 11-23)					
Stratum	Dioxin Category	n	Percent Abnormal	Adjusted Relative Risk (95% C.I.)^a	p-Value
No	Comparison	397	2.5		
	Background RH	92	0.0	--	--
	Low RH	51	3.9	1.65 (0.35,7.85)	0.526
	High RH	67	6.0	3.09 (0.93,10.32)	0.066
	Low plus High RH	118	5.1	2.40 (0.84,6.82)	0.101
Yes	Comparison	665	2.6		
	Background RH	281	4.3	1.47 (0.69,3.15)	0.319
	Low RH	209	2.9	1.18 (0.46,3.06)	0.729
	High RH	190	2.1	1.02 (0.33,3.09)	0.979
	Low plus High RH	399	2.5	1.11 (0.50,2.46)	0.802

^a Relative risk and confidence interval relative to Comparisons.

--: Adjusted relative risk, confidence interval, and p-value not presented due to the sparse number of abnormalities.

Note: RH = Ranch Hand.

Comparison: Current Dioxin \leq 10 ppt.

Background (Ranch Hand): Current Dioxin \leq 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin \leq 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table G-2-8.
Interaction Table for Patellar Reflex

a) MODEL 1: RANCH HANDS VS. COMPARISONS — ADJUSTED (Group-by-Lifetime Alcohol History: Table 11-24)						
Stratum	Occupational Category	Group	n	Percent Abnormal	Adj. Relative Risk (95% C.I.)	p-Value
0 Drink-years	All	Ranch Hand	63	4.8	4.10 (0.40,42.46)	0.236
		Comparison	71	1.4		
> 0-40 Drink-years	All	Ranch Hand	625	1.0	0.49 (0.19,1.29)	0.148
		Comparison	854	1.9		
> 40 Drink-years	All	Ranch Hand	235	0.9	0.13 (0.03,0.59)	0.008
		Comparison	328	4.6		
0 Drink-years	Officer	Ranch Hand	14	0.0	--	--
		Comparison	24	4.2		
	Enlisted Flyer	Ranch Hand	14	7.1	--	--
		Comparison	12	0.0		
	Enlisted Groundcrew	Ranch Hand	35	5.7	--	--
		Comparison	35	0.0		
> 0-40 Drink-years	Officer	Ranch Hand	252	0.4	0.21 (0.04,1.09)	0.063
		Comparison	340	2.1		
	Enlisted Flyer	Ranch Hand	95	0.0	--	--
		Comparison	122	0.8		
	Enlisted Groundcrew	Ranch Hand	278	1.8	0.83 (0.28,2.50)	0.738
		Comparison	392	2.0		
> 40 Drink-years	Officer	Ranch Hand	96	2.1	0.12 (0.02,0.68)	0.017
		Comparison	127	5.5		
	Enlisted Flyer	Ranch Hand	47	0.0	--	--
		Comparison	65	9.2		
	Enlisted Groundcrew	Ranch Hand	92	0.0	--	--
		Comparison	136	1.5		

Table G-2-8. (Continued)
Interaction Table for Patellar Reflex

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Lifetime Alcohol History: Table 11-24)					
Stratum	Dioxin Category	n	Percent Abnormal	Adjusted Relative Risk (95% C.I.)^a	p-Value
0 Drink-years	Comparison	54	1.9		
	Background RH	20	0.0	--	--
	Low RH	15	6.7	7.04 (0.38,129.89)	0.190
	High RH	24	4.2	4.52 (0.22,92.99)	0.328
	Low plus High RH	39	5.1	5.53 (0.42,76.66)	0.196
>0-40 Drink-years	Comparison	706	2.0		
	Background RH	257	0.4	0.20 (0.03,1.55)	0.123
	Low RH	170	0.6	0.22 (0.03,1.73)	0.149
	High RH	162	2.5	1.29 (0.38,4.38)	0.684
	Low plus High RH	332	1.5	0.65 (0.20,2.09)	0.472
>40 Drink-years	Comparison	280	4.6		
	Background RH	86	0.0	--	0.823
	Low RH	69	2.9	0.41 (0.01,12.37)	0.606
	High RH	64	0.0	--	0.527
	Low plus High RH	133	1.5	0.23 (0.05,1.10)	0.066

^a Relative risk and confidence interval relative to Comparisons.

--: Adjusted relative risk, confidence interval, and p-value not presented due to the sparse number of abnormalities.

Note: Model 3: RH = Ranch Hand.

Comparison: Current Dioxin \leq 10 ppt.

Background (Ranch Hand): Current Dioxin \leq 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin \leq 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table G-2-9.
Interaction Table for Achilles Reflex

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Lifetime Alcohol History: Table 11-25)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log _e (Initial Dioxin)	
Stratum	Initial Dioxin	n	Percent Abnormal	Adjusted Relative Risk (95% C.I.) ^a	p-Value
0 Drink-years	Low	10	0.0	1.85 (0.96,3.59)	0.068
	Medium	12	16.7		
	High	17	29.4		
>0-40 Drink-years	Low	118	10.2	0.98 (0.73,1.33)	0.901
	Medium	108	13.0		
	High	105	6.7		
>40 Drink-years	Low	42	14.3	0.86 (0.52,1.44)	0.573
	Medium	48	4.2		
	High	43	7.0		

Table G-2-9. (Continued)
Interaction Table for Achilles Reflex

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Lifetime Alcohol History: Table 11-25)					
Stratum	Dioxin Category	n	Percent Abnormal	Adjusted Relative Risk (95% C.I.) ^b	p-Value
0 Drink-years	Comparison	54	7.4		
	Background RH	20	0.0	--	--
	Low RH	15	6.7	0.95 (0.10,9.35)	0.962
	High RH	24	25.0	4.67 (1.14,19.21)	0.033
	Low plus High RH	39	18.0	2.97 (0.78,11.29)	0.109
>0-40 Drink-years	Comparison	705	8.1		
	Background RH	257	8.6	1.04 (0.61,1.76)	0.894
	Low RH	169	10.7	1.10 (0.61,1.96)	0.754
	High RH	162	9.3	1.27 (0.68,2.36)	0.459
	Low plus High RH	331	10.0	1.17 (0.73,1.87)	0.514
>40 Drink-years	Comparison	281	11.7		
	Background RH	86	12.8	1.18 (0.56,2.51)	0.668
	Low RH	69	11.6	0.80 (0.34,1.89)	0.616
	High RH	64	4.7	0.35 (0.10,1.22)	0.101
	Low plus High RH	133	8.3	0.59 (0.28,1.24)	0.168

^a Relative risk for a twofold increase in initial dioxin.

^b Relative risk and confidence interval relative to Comparisons.

--: Adjusted relative risk, confidence interval, and p-value not presented due to the sparse number of abnormalities.

Note: Model 2: Low = 39-98 ppt; Medium = > 98-232 ppt; High = > 232 ppt.

Model 3: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table G-2-10.

Interaction Table for Vibrotactile Threshold Measurement of Right Great Toe (microns)

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Composite Exposure to Heavy Metals: Table 11-28)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log _e (Initial Dioxin)	
Stratum	Initial Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
No	Low	142	17.23	-0.0256 (0.0455)	0.575
	Medium	140	22.19		
	High	129	16.24		
Yes	Low	29	14.35	0.2556 (0.0828)	0.002
	Medium	27	21.62		
	High	36	28.20		

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Lifetime Alcohol History: Table 11-28)					
Stratum	Dioxin Category	n	Adjusted Mean ^a	Difference of Adjusted Mean vs. Comparisons (95% C.I.) ^c	p-Value ^d
0 Drink-years	Comparison	54	12.09		
	Background RH	20	15.19	3.09 --	0.414
	Low RH	15	17.04	4.95 --	0.266
	High RH	24	21.94	9.85 --	0.026
	Low plus High RH	39	20.06	7.97 --	0.028
>0-40 Drink-years	Comparison	705	17.83		
	Background RH	259	14.39	-3.44 --	0.007
	Low RH	169	18.43	0.60 --	0.716
	High RH	162	17.09	-0.74 --	0.658
	Low plus High RH	331	17.78	-0.05 --	0.959
>40 Drink-years	Comparison	281	17.58		
	Background RH	86	22.81	5.23 --	0.049
	Low RH	69	14.45	-3.13 --	0.170
	High RH	64	20.75	3.17 --	0.269
	Low plus High RH	133	17.48	-0.10 --	0.845

Table G-2-10. (Continued)
Interaction Table for Vibrotactile Threshold Measurement of Right Great Toe (microns)

c) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Lifetime Alcohol History: Table 11-28)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
0 Drink-years	Low	17	14.52	0.1145 (0.0870)	0.189
	Medium	18	16.07		
	High	24	25.93		
>0-40 Drink-years	Low	205	14.04	0.0535 (0.0353)	0.130
	Medium	196	18.53		
	High	189	17.54		
>40 Drink-years	Low	68	21.02	-0.0684 (0.0519)	0.188
	Medium	78	19.11		
	High	73	18.98		

d) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Composite Exposure to Heavy Metals: Table 11-28)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
No	Low	254	15.62	-0.0054 (0.0318)	0.864
	Medium	246	18.54		
	High	235	16.90		
Yes	Low	36	13.06	0.1939 (0.0644)	0.003
	Medium	46	16.32		
	High	51	24.21		

Table G-2-10. (Continued)
Interaction Table for Vibrotactile Threshold Measurement of Right Great Toe (microns)

e) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Lifetime Alcohol History: Table 11-28)					
Current Dioxin Category Summary Statistics				Analysis Results for Log _e (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
0 Drink-years	Low	18	16.23	0.0893 (0.0723)	0.217
	Medium	14	15.24		
	High	27	23.50		
> 0-40 Drink-years	Low	207	13.72	0.0521 (0.0304)	0.087
	Medium	200	19.05		
	High	183	17.48		
> 40 Drink-years	Low	69	21.43	-0.0630 (0.0428)	0.141
	Medium	75	19.07		
	High	75	18.71		

f) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Composite Exposure to Heavy Metals: Table 11-28)					
Current Dioxin Category Summary Statistics				Analysis Results for Log _e (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
No	Low	259	15.20	-0.0000 (0.0269)	0.999
	Medium	244	18.75		
	High	232	17.00		
Yes	Low	35	14.18	0.1495 (0.0562)	0.008
	Medium	45	16.72		
	High	53	21.95		

Table G-2-10. (Continued)
Interaction Table for Vibrotactile Threshold Measurement of Right Great Toe (microns)

g) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Lifetime Alcohol History: Table 11-28)					
Current Dioxin Category Summary Statistics				Analysis Results for Log _e (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
0 Drink-years	Low	18	16.29	0.0865 (0.0730)	0.236
	Medium	14	15.27		
	High	27	23.59		
> 0-40 Drink-years	Low	206	13.86	0.0442 (0.0323)	0.171
	Medium	200	19.12		
	High	183	17.58		
> 40 Drink-years	Low	69	21.51	-0.0660 (0.0438)	0.132
	Medium	75	19.13		
	High	75	18.77		

h) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Composite Exposure to Heavy Metals: Table 11-28)					
Current Dioxin Category Summary Statistics				Analysis Results for Log _e (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
No	Low	259	15.22	-0.0013 (0.0283)	0.962
	Medium	244	18.78		
	High	232	17.03		
Yes	Low	34	14.77	0.1356 (0.0604)	0.026
	Medium	45	16.69		
	High	53	21.99		

^a Transformed from natural logarithm scale.

^b Slope and standard error based on natural logarithm of vibrotactile threshold measurement of right toe versus log_e dioxin.

^c Difference of means after transformation to original scale; confidence interval on difference of means not presented because analysis was performed on natural logarithm scale.

^d P-value is based on difference of means on natural logarithm scale.

Note: Model 2: Low = 39-98 ppt; Medium = > 98-232 ppt; High = > 232 ppt.

Model 3: Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Model 4: Low = ≤ 8.1 ppt; Medium = > 8.1-20.5 ppt; High = > 20.5 ppt.

Models 5 and 6: Low = ≤ 46 ppq; Medium = > 46-128 ppq; High = > 128 ppq.

Table G-2-11.

Interaction Table for Vibrotactile Threshold Measurement of Left Great Toe (microns)

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Diabetic Class: Table 11-29)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Initial Dioxin)	
Stratum	Initial Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
Normal	Low	120	17.52	-0.0302 (0.0465)	0.516
	Medium	117	16.77		
	High	108	15.48		
Impaired	Low	22	11.38	0.2082 (0.0898)	0.021
	Medium	24	25.16		
	High	28	26.95		
Diabetic	Low	31	20.21	-0.0260 (0.0743)	0.727
	Medium	31	18.04		
	High	34	16.22		

b) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Composite Exposure to Heavy Metals: Table 11-29)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Initial Dioxin)	
Stratum	Initial Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
No	Low	144	17.71	-0.0280 (0.0410)	0.495
	Medium	144	17.91		
	High	134	15.84		
Yes	Low	29	15.50	0.1622 (0.0815)	0.047
	Medium	28	20.22		
	High	36	24.91		

Table G-2-11. (Continued)
Interaction Table for Vibrotactile Threshold Measurement of Left Great Toe (microns)

c) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Lifetime Alcohol History: Table 11-29)					
Current Dioxin Category Summary Statistics				Analysis Results for Log _e (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
0 Drink-years	Low	17	22.79	-0.0077 (0.0859)	0.929
	Medium	18	15.46		
	High	24	21.44		
> 0-40 Drink-years	Low	205	15.44	0.0542 (0.0349)	0.121
	Medium	196	20.06		
	High	189	18.65		
> 40 Drink-years	Low	68	21.74	-0.0482 (0.0512)	0.346
	Medium	78	21.23		
	High	73	20.25		

d) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Diabetic Class: Table 11-29)					
Current Dioxin Category Summary Statistics				Analysis Results for Log _e (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
Normal	Low	235	16.69	0.0033 (0.0336)	0.922
	Medium	205	20.16		
	High	187	16.65		
Impaired	Low	27	14.26	0.1940 (0.0742)	0.009
	Medium	31	13.46		
	High	47	30.38		
Diabetic	Low	28	17.55	-0.0097 (0.0602)	0.872
	Medium	56	20.54		
	High	52	18.13		

Table G-2-11. (Continued)
Interaction Table for Vibrotactile Threshold Measurement of Left Great Toe (microns)

e) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Worked with Vibrating Power Equipment or Tools: Table 11-29)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
No	Low	232	17.79	-0.0208 (0.0339)	0.540
	Medium	223	20.20		
	High	201	17.21		
Yes	Low	58	14.68	0.1184 (0.0485)	0.015
	Medium	69	18.87		
	High	85	23.27		

f) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Lifetime Alcohol History: Table 11-29)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
0 Drink-years	Low	18	20.10	-0.0042 (0.0711)	0.953
	Medium	14	17.72		
	High	27	19.85		
> 0-40 Drink-years	Low	208	15.00	0.0502 (0.0296)	0.090
	Medium	200	19.14		
	High	183	18.69		
> 40 Drink-years	Low	69	21.57	-0.0520 (0.0419)	0.215
	Medium	75	20.35		
	High	75	19.61		

g) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Worked with Vibrating Power Equipment or Tools: Table 11-29)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
No	Low	241	17.21	-0.0186 (0.0283)	0.511
	Medium	214	19.51		
	High	201	16.99		
Yes	Low	54	13.92	0.0941 (0.0406)	0.021
	Medium	75	18.34		
	High	84	23.05		

Table G-2-11. (Continued)
Interaction Table for Vibrotactile Threshold Measurement of Left Great Toe (microns)

h) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Lifetime Alcohol History: Table 11-29)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
0 Drink-years	Low	18	19.89	-0.0021 (0.0719)	0.977
	Medium	14	17.62		
	High	27	19.97		
>0-40 Drink-years	Low	207	14.91	0.0525 (0.0317)	0.098
	Medium	200	19.13		
	High	183	18.82		
>40 Drink-years	Low	69	21.43	-0.0500 (0.0430)	0.245
	Medium	75	20.31		
	High	75	19.76		

i) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Worked With Vibrating Power Equipment or Tools: Table 11-29)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
No	Low	241	17.11	-0.0172 (0.0302)	0.568
	Medium	214	19.49		
	High	201	17.08		
Yes	Low	53	13.87	0.0982 (0.0428)	0.022
	Medium	75	18.31		
	High	84	23.13		

^a Transformed from natural logarithm scale.

^b Slope and standard error based on natural logarithm of vibrotactile threshold measurement of left great toe versus log₂ dioxin.

Note: Model 2: Low = 39-98 ppt; Medium = > 98-232 ppt; High = > 232 ppt.

Model 4: Low = ≤ 8.1 ppt; Medium = > 8.1-20.5 ppt; High = > 20.5 ppt.

Models 5 and 6: Low = ≤ 46 ppq; Medium = > 46-128 ppq; High = > 128 ppq.

Table G-2-12.
Interaction Table for Tremor

a) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Age: Table 11-30)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent Abnormal	Adjusted Relative Risk (95% C.I.) ^a	p-Value
Born ≥ 1942	Low	97	4.1	0.66 (0.42,1.02)	0.060
	Medium	95	3.2		
	High	164	1.8		
Born < 1942	Low	193	3.1	1.36 (0.89,2.08)	0.160
	Medium	197	0.0		
	High	123	5.7		

^a Relative risk for a twofold increase in current dioxin.

Table G-2-13.
Interaction Table for Gait

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Age: Table 11-33)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log₂ (Initial Dioxin)	
Stratum	Initial Dioxin	n	Percent Abnormal	Adjusted Relative Risk (95% C.I.)^a	p-Value
Born ≥ 1942	Low	54	3.7	0.62 (0.33,1.16)	0.136
	Medium	71	5.6		
	High	106	0.9		
Born < 1942	Low	117	2.6	1.65 (1.05,2.61)	0.031
	Medium	97	0.0		
	High	59	11.9		

^a Relative risk for a twofold increase in initial dioxin.

APPENDIX G-3.

Neurology Analysis Tables Occupation and Diabetic Class Removed from Final Model

This appendix contains results of exposure analyses after occupation and diabetic class have been removed from those final dioxin models (Models 2 through 6) that contained occupation or diabetic class. These analyses are performed to investigate the relationship of the dependent variable to dioxin without removing any effects due to occupation or diabetic class. The format of these tables closely parallels the adjusted panels of Chapter 11 tables. A summary of the tables found in this appendix follows.

Appendix G-3 Table	Chapter 11 Table	Dependent Variable
G-3-1	11-4	Hereditary and Degenerative Diseases
G-3-2	11-5	Peripheral Disorders
G-3-3	11-6	Other Neurological Disorders
G-3-4	11-17	Speech
G-3-5	11-19	Neck Range of Motion
G-3-6	11-20	Cranial Nerve Index without Range of Motion
G-3-7	11-21	Pin Prick
G-3-8	11-22	Light Touch
G-3-9	11-24	Patellar Reflex
G-3-10	11-25	Achilles Reflex
G-3-11	11-26	Biceps Reflex
G-3-12	11-27	Babinski Reflex
G-3-13	11-28	Vibrotactile Threshold Measurement of Right Great Toe
G-3-14	11-29	Vibrotactile Threshold Measurement of Left Great Toe
G-3-15	11-30	Tremor
G-3-16	11-33	Gait
G-3-17	11-34	Central Nervous System (CNS) Index

Table G-3-1.
Analysis of Hereditary and Degenerative Diseases
Occupation and Diabetic Class Removed from Final Model

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED			
Analysis Results for Log_e (Initial Dioxin)^a			
n	Adj. Relative Risk (95% C.I.)^b	p-Value	Covariate Remarks
504	0.91 (0.65,1.27)	0.566	AGE (p=0.294) DRKYR*INS (p=0.015)

^a Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^b Relative risk for a twofold increase in initial dioxin.

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED				
Dioxin Category	n	Adj. Relative Risk (95% C.I.)^{ab}	p-Value	Covariate Remarks
Comparison	1,043			AGE (p=0.015) DRKYR (p=0.101)
Background RH	366	1.08 (0.66,1.78)	0.764	
Low RH	254	1.00 (0.55,1.83)	0.999	
High RH	250	0.87 (0.44,1.69)	0.674	
Low plus High RH	504	0.94 (0.58,1.52)	0.792	

^a Relative risk and confidence interval relative to Comparisons.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

Note: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table G-3-1. (Continued)
Analysis of Hereditary and Degenerative Diseases
Occupation and Diabetic Class Removed from Final Model

c) MODELS 4, 5, AND 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED				
Model ^a	Analysis Results for Log ₂ (Current Dioxin + 1)			
	n	Adj. Relative Risk (95% C.I.) ^b	p-Value	Covariate Remarks
4	890	0.87 (0.71,1.06)	0.165	AGE (p=0.831)
5	890	0.89 (0.75,1.05)	0.166	AGE (p=0.798)
6 ^c	869	0.84 (0.70,1.01)	0.069	AGE (p=0.615) DRKYR (p=0.242)

^a Model 4: Log₂ (lipid-adjusted current dioxin + 1).

Model 5: Log₂ (whole-weight current dioxin + 1).

Model 6: Log₂ (whole-weight current dioxin + 1), adjusted for log₂ total lipids.

^b Relative risk for a twofold increase in current dioxin.

^c Adjusted for log₂ total lipids in addition to covariates specified under "Covariate Remarks" column.

Table G-3-2.
Analysis of Peripheral Disorders
Occupation and Diabetic Class Removed from Final Model

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED			
Analysis Results for Log₂ (Initial Dioxin)^a			
n	Adj. Relative Risk (95% C.I.)^b	p-Value	Covariate Remarks
517	1.08 (0.90,1.29)	0.398	AGE (p=0.059) RACE (p=0.122)

^a Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^b Relative risk for a twofold increase in initial dioxin.

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED				
Dioxin Category	n	Adj. Relative Risk (95% C.I.)^{ab}	p-Value	Covariate Remarks
Comparison	1,059			DC (p=0.064) AGE*INS (p=0.018)
Background RH	370	0.92 (0.66,1.28)	0.621	
Low RH	260	1.01 (0.71,1.45)	0.937	
High RH	257	1.10 (0.76,1.59)	0.618	
Low plus High RH	517	1.05 (0.79,1.40)	0.718	

^a Relative risk and confidence interval relative to Comparisons.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

Note: RH = Ranch Hand.

Comparison: Current Dioxin \leq 10 ppt.

Background (Ranch Hand): Current Dioxin \leq 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin \leq 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table G-3-2. (Continued)
Analysis of Peripheral Disorders
Occupation and Diabetic Class Removed from Final Model

c) MODELS 4, 5, AND 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED				
Analysis Results for Log ₂ (Current Dioxin + 1)				
Model ^a	n	Adj. Relative Risk (95% C.I.) ^b	p-Value	Covariate Remarks
4	867	1.14 (1.00,1.30)**	0.049**	CURR*DRKYR (p=0.001) AGE (p<0.001) RACE (p=0.139) INS (p=0.072) DC*DRKYR (p=0.053)
5	867	1.12 (1.00,1.25)**	0.043**	CURR*DRKYR (p=0.012) AGE (p<0.001) RACE (p=0.151) INS (p=0.046)
6 ^c	867	1.14 (1.01,1.29)**	0.027**	CURR*DRKYR (p=0.012) AGE (p<0.001) RACE (p=0.135) INS (p=0.047)

^a Model 4: Log₂ (lipid-adjusted current dioxin + 1):

Model 5: Log₂ (whole-weight current dioxin + 1).

Model 6: Log₂ (whole-weight current dioxin + 1), adjusted for log₂ total lipids.

^b Relative risk for a twofold increase in current dioxin.

^c Adjusted for log₂ total lipids in addition to covariates specified under "Covariate Remarks" column.

** Log₂ (current dioxin + 1)-by-covariate interaction (p≤0.05); adjusted relative risk, confidence interval, and p-value derived after deletion of this interaction; refer to Appendix Table G-4-1 for further analysis of this interaction.

Table G-3-3.
Analysis of Other Neurological Disorders
Occupation Removed from Final Model

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED			
Analysis Results for Log₂ (Initial Dioxin)^a			
n	Adj. Relative Risk (95% C.I.)^b	p-Value	Covariate Remarks
516	1.21 (1.03,1.42)	0.022	AGE (p<0.001)

^a Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^b Relative risk for a twofold increase in initial dioxin.

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED				
Dioxin Category	n	Adj. Relative Risk (95% C.I.)^{ab}	p-Value	Covariate Remarks
Comparison	1,056			AGE (p<0.001) RACE (p<0.001)
Background RH	370	0.74 (0.53,1.01)	0.061	
Low RH	259	1.06 (0.76,1.48)	0.747	
High RH	257	1.69 (1.21,2.36)	0.002	
Low plus High RH	516	1.32 (1.02,1.71)	0.034	

^a Relative risk and confidence interval relative to Comparisons.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

Note: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table G-3-3. (Continued)
Analysis of Other Neurological Disorders
Occupation Removed from Final Model

c) MODELS 4, 5, AND 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED				
Model ^a	Analysis Results for Log ₂ (Current Dioxin + 1)			
	n	Adj. Relative Risk (95% C.I.) ^b	p-Value	Covariate Remarks
4	886	1.24 (1.10,1.39)	<0.001	AGE (p<0.001) RACE (p<0.001)
5	886	1.17 (1.05,1.29)	0.003	AGE (p<0.001) RACE (p<0.001)
6 ^c	885	1.24 (1.11,1.39)	0.001	AGE (p<0.001) RACE (p<0.001)

^a Model 4: Log₂ (lipid-adjusted current dioxin + 1).

Model 5: Log₂ (whole-weight current dioxin + 1).

Model 6: Log₂ (whole-weight current dioxin + 1), adjusted for log₂ total lipids.

^b Relative risk for a twofold increase in current dioxin.

^c Adjusted for log₂ total lipids in addition to covariates specified under "Covariate Remarks" column.

Table G-3-4.
Analysis of Speech
Occupation Removed from Final Model

a) MODELS 4, 5, AND 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED				
Model ^a	Analysis Results for Log ₂ (Current Dioxin + 1)			
	n	Adj. Relative Risk (95% C.I.) ^b	p-Value	Covariate Remarks
4	890	1.43 (0.78,2.60)	0.266	AGE (p=0.049)
5	890	1.37 (0.79,2.37)	0.269	AGE (p=0.051)
6 ^c	889	1.39 (0.77,2.51)	0.286	AGE (p=0.051)

^a Model 4: Log₂ (lipid-adjusted current dioxin + 1).

Model 5: Log₂ (whole-weight current dioxin + 1).

Model 6: Log₂ (whole-weight current dioxin + 1), adjusted for log₂ total lipids.

^b Relative risk for a twofold increase in current dioxin.

^c Adjusted for log₂ total lipids in addition to covariates specified under "Covariate Remarks" column.

Table G-3-5.
Analysis of Neck Range of Motion
Occupation and Diabetic Class Removed from Final Model

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED			
Analysis Results for Log₂ (Initial Dioxin)^a			
n	Adj. Relative Risk (95% C.I.)^b	p-Value	Covariate Remarks
516	1.08 (0.88,1.32)	0.484	AGE (p<0.001)

^a Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^b Relative risk for a twofold increase in initial dioxin.

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED				
Dioxin Category	n	Adj. Relative Risk (95% C.I.)^{ab}	p-Value	Covariate Remarks
Comparison	1,062			AGE (p<0.001)
Background RH	373	0.95 (0.66,1.37)	0.785	
Low RH	260	1.05 (0.70,1.56)	0.816	
High RH	256	1.38 (0.90,2.12)	0.140	
Low plus High RH	516	1.18 (0.86,1.63)	0.307	

^a Relative risk and confidence interval relative to Comparisons.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

Note: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table G-3-5. (Continued)
Analysis of Neck Range of Motion
Occupation and Diabetic Class Removed from Final Model

c) MODELS 4, 5, AND 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED				
Analysis Results for Log ₂ (Current Dioxin + 1)				
Model ^a	n	Adj. Relative Risk (95% C.I.) ^b	p-Value	Covariate Remarks
4	869	1.16 (1.00,1.35)	0.049	AGE (p<0.001) DRKYR (p=0.843) INS (p=0.168)
5	869	1.14 (1.00,1.29)	0.045	AGE (p<0.001) DRKYR (p=0.851) INS (p=0.165)
6 ^c	868	1.13 (0.99,1.30)	0.075	AGE (p<0.001) DRKYR (p=0.852) INS (p=0.164)

^a Model 4: Log₂ (lipid-adjusted current dioxin + 1).

Model 5: Log₂ (whole-weight current dioxin + 1).

Model 6: Log₂ (whole-weight current dioxin + 1), adjusted for log₂ total lipids.

^b Relative risk for a twofold increase in current dioxin.

^c Adjusted for log₂ total lipids in addition to covariates specified under "Covariate Remarks" column.

Table G-3-6.
Analysis of Cranial Nerve Index without Range of Motion
Occupation and Diabetic Class Removed from Final Model

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED			
Analysis Results for Log_e (Initial Dioxin)^a			
n	Adj. Relative Risk (95% C.I.)^b	p-Value	Covariate Remarks
515	1.16 (0.84,1.59)	0.368	AGE (p=0.140)

^a Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^b Relative risk for a twofold increase in initial dioxin.

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED				
Dioxin Category	n	Adj. Relative Risk (95% C.I.)^{ab}	p-Value	Covariate Remarks
Comparison	1,058			AGE (p=0.003) INS (p=0.050)
Background RH	372	1.17 (0.64,2.17)	0.608	
Low RH	259	1.47 (0.77,2.79)	0.245	
High RH	256	1.42 (0.70,2.88)	0.329	
Low plus High RH	515	1.45 (0.85,2.46)	0.175	

^a Relative risk and confidence interval relative to Comparisons.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

Note: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table G-3-6. (Continued)
Analysis of Cranial Nerve Index without Range of Motion
Occupation and Diabetic Class Removed from Final Model

c) MODELS 4, 5, AND 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED				
Analysis Results for Log ₂ (Current Dioxin + 1)				
Model ^a	n	Adj. Relative Risk (95% C.I.) ^b	p-Value	Covariate Remarks
4	887	1.09 (0.87,1.36)	0.468	AGE (p=0.144) INS (p=0.301)
5	887	1.06 (0.87,1.28)	0.583	AGE (p=0.157) INS (p=0.302)
6 ^c	886	1.05 (0.85,1.29)	0.650	AGE (p=0.162) INS (p=0.301)

^a Model 4: Log₂ (lipid-adjusted current dioxin + 1).

Model 5: Log₂ (whole-weight current dioxin + 1).

Model 6: Log₂ (whole-weight current dioxin + 1), adjusted for log₂ total lipids.

^b Relative risk for a twofold increase in current dioxin.

^c Adjusted for log₂ total lipids in addition to covariates specified under "Covariate Remarks" column.

Table G-3-7.
Analysis of Pin Prick
Occupation and Diabetic Class Removed from Final Model

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED			
Analysis Results for Log₂ (Initial Dioxin)^a			
n	Adj. Relative Risk (95% C.I.)^b	p-Value	Covariate Remarks
491	1.03 (0.78,1.37)	0.833	AGE (p=0.183)

^a Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^b Relative risk for a twofold increase in initial dioxin.

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED				
Dioxin Category	n	Adj. Relative Risk (95% C.I.)^{ab}	p-Value	Covariate Remarks
Comparison	1,013			AGE (p<0.001)
Background RH	361	0.87 (0.49,1.55)	0.634	
Low RH	245	1.22 (0.69,2.13)	0.494	
High RH	246	0.98 (0.52,1.85)	0.957	
Low plus High RH	491	1.11 (0.70,1.76)	0.667	

^a Relative risk and confidence interval relative to Comparisons.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

Note: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table G-3-7. (Continued)
Analysis of Pin Prick
Occupation and Diabetic Class Removed from Final Model

c) MODELS 4, 5, AND 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED				
Model ^a	Analysis Results for Log ₂ (Current Dioxin + 1)			
	n	Adj. Relative Risk (95% C.I.) ^b	p-Value	Covariate Remarks
4	852	1.30 (1.06,1.59)	0.014	AGE (p<0.001)
5	852	1.26 (1.05,1.52)	0.013	AGE (p<0.001)
6 ^c	851	1.28 (1.05,1.57)	0.014	AGE (p<0.001)

^a Model 4: Log₂ (lipid-adjusted current dioxin + 1).

Model 5: Log₂ (whole-weight current dioxin + 1).

Model 6: Log₂ (whole-weight current dioxin + 1), adjusted for log₂ total lipids.

^b Relative risk for a twofold increase in current dioxin.

^c Adjusted for log₂ total lipids in addition to covariates specified under "Covariate Remarks" column.

Table G-3-8.
Analysis of Light Touch
Occupation and Diabetic Class Removed from Final Model

a) MODELS 4, 5, AND 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED				
Analysis Results for Log ₂ (Current Dioxin + 1)				
Model ^a	n	Adj. Relative Risk (95% C.I.) ^b	p-Value	Covariate Remarks
4	852	1.22 (0.98,1.51)	0.079	AGE (p=0.002)
5	852	1.21 (1.00,1.47)	0.049	AGE (p=0.002)
6 ^c	851	1.19 (0.96,1.46)	0.108	AGE (p=0.002)

^a Model 4: Log₂ (lipid-adjusted current dioxin + 1).

Model 5: Log₂ (whole-weight current dioxin + 1).

Model 6: Log₂ (whole-weight current dioxin + 1), adjusted for log₂ total lipids.

^b Relative risk for a twofold increase in current dioxin.

^c Adjusted for log₂ total lipids in addition to covariates specified under "Covariate Remarks" column.

Table G-3-9.
Analysis of Patellar Reflex
Occupation and Diabetic Class Removed from Final Model

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED			
Analysis Results for Log_e (Initial Dioxin)^a			
n	Adj. Relative Risk (95% C.I.)^b	p-Value	Covariate Remarks
504	1.18 (0.70,1.99)	0.541	AGE (p=0.030) DRKYR (p=0.078)

^a Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^b Relative risk for a twofold increase in initial dioxin.

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED				
Dioxin Category	n	Adj. Relative Risk (95% C.I.)^{ab}	p-Value	Covariate Remarks
Comparison	1,041			AGE (p<0.001) DRKYR (p=0.131)
Background RH	364	0.11 (0.01,0.78)	0.028	
Low RH	254	0.49 (0.17,1.42)	0.187	
High RH	250	0.76 (0.28,2.05)	0.590	
Low plus High RH	504	0.61 (0.28,1.32)	0.207	

^a Relative risk and confidence interval relative to Comparisons.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

Note: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table G-3-9. (Continued)
Analysis of Patellar Reflex
Occupation and Diabetic Class Removed from Final Model

c) MODELS 4, 5, AND 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED				
Model ^a	Analysis Results for Log ₂ (Current Dioxin + 1)			
	n	Adj. Relative Risk (95% C.I.) ^b	p-Value	Covariate Remarks
4	868	1.56 (1.01,2.41)	0.050	AGE (p=0.013) DRKYR (p=0.053)
5	868	1.43 (0.96,2.13)	0.081	AGE (p=0.016) DRKYR (p=0.053)
6 ^c	867	1.60 (1.04,2.46)	0.034	AGE (p=0.010) DRKYR (p=0.062)

^a Model 4: Log₂ (lipid-adjusted current dioxin + 1).

Model 5: Log₂ (whole-weight current dioxin + 1).

Model 6: Log₂ (whole-weight current dioxin + 1), adjusted for log₂ total lipids.

^b Relative risk for a twofold increase in current dioxin.

^c Adjusted for log₂ total lipids in addition to covariates specified under "Covariate Remarks" column.

Table G-3-10.
Analysis of Achilles Reflex
Occupation and Diabetic Class Removed from Final Model

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED			
Analysis Results for Log₂ (Initial Dioxin)^a			
n	Adj. Relative Risk (95% C.I.)^b	p-Value	Covariate Remarks
503	1.09 (0.86,1.37)**	0.484**	INIT*DRKYR (p=0.032) AGE (p=0.010) INS (p=0.088)

^a Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^b Relative risk for a twofold increase in initial dioxin.

** Log₂ (initial dioxin)-by-covariate interaction ($0.01 < p \leq 0.05$); adjusted relative risk, confidence interval, and p-value derived from a model fitted after deletion of this interaction; refer to Appendix Table G-4-2 for further analysis of this interaction.

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED				
Dioxin Category	n	Adj. Relative Risk (95% C.I.)^{ab}	p-Value	Covariate Remarks
Comparison	1,041			DXCAT*DRKYR (p=0.008) AGE*DRKYR (p=0.006)
Background RH	364	1.04 (0.68,1.59)**	0.865**	
Low RH	253	1.06 (0.67,1.68)**	0.805**	
High RH	250	1.16 (0.71,1.88)**	0.561**	
Low plus High RH	503	1.10 (0.76,1.59)**	0.603**	

^a Relative risk and confidence interval relative to Comparisons.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

** Categorized dioxin-by-covariate interaction ($p \leq 0.05$); adjusted relative risk, confidence interval, and p-value derived from a model fitted after deletion of this interaction; refer to Appendix Table G-4-2 for further analysis of this interaction.

Note: RH = Ranch Hand.

Comparison: Current Dioxin \leq 10 ppt.

Background (Ranch Hand): Current Dioxin \leq 10 ppt.

Low (Ranch Hand): Current Dioxin $>$ 10 ppt, 10 ppt $<$ Initial Dioxin \leq 143 ppt.

High (Ranch Hand): Current Dioxin $>$ 10 ppt, Initial Dioxin $>$ 143 ppt.

Table G-3-10. (Continued)
Analysis of Achilles Reflex
Occupation and Diabetic Class Removed from Final Model

c) MODELS 4, 5, AND 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED				
Analysis Results for Log ₂ (Current Dioxin + 1)				
Model ^a	n	Adj. Relative Risk (95% C.I.) ^b	p-Value	Covariate Remarks
4	867	1.11 (0.94,1.31)	0.204	AGE (p<0.001) DRKYR (p=0.722)
5	867	1.09 (0.95,1.26)	0.231	AGE (p<0.001) DRKYR (p=0.711)
6 ^c	866	1.09 (0.93,1.27)	0.300	AGE (p<0.001) DRKYR (p=0.710)

^a Model 4: Log₂ (lipid-adjusted current dioxin + 1).
Model 5: Log₂ (whole-weight current dioxin + 1).
Model 6: Log₂ (whole-weight current dioxin + 1), adjusted for log₂ total lipids.

^b Relative risk for a twofold increase in current dioxin.

^c Adjusted for log₂ total lipids in addition to covariates specified under "Covariate Remarks" column.

Table G-3-11.
Analysis of Biceps Reflex
Occupation Removed from Final Model

a) MODELS 4, 5, AND 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED				
Model ^a	Analysis Results for Log ₂ (Current Dioxin + 1)			
	n	Adj. Relative Risk (95% C.I.) ^b	p-Value	Covariate Remarks
4	890	1.26 (0.73,2.16)	0.415	AGE (p=0.014)
5	890	1.14 (0.70,1.86)	0.599	AGE (p=0.017)
6 ^c	889	1.39 (0.80,2.39)	0.243	AGE (p=0.011)

^a Model 4: Log₂ (lipid-adjusted current dioxin + 1).

Model 5: Log₂ (whole-weight current dioxin + 1).

Model 6: Log₂ (whole-weight current dioxin + 1), adjusted for log₂ total lipids.

^b Relative risk for a twofold increase in current dioxin.

^c Adjusted for log₂ total lipids in addition to covariates specified under "Covariate Remarks" column.

Table G-3-12.
Analysis of Babinski Reflex
Occupation Removed from Final Model

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED				
Dioxin Category	n	Adj. Relative Risk (95% C.I.) ^{ab}	p-Value	Covariate Remarks
Comparison	1,061			AGE (p=0.051)
Background RH	373	0.66 (0.13,3.25)	0.607	
Low RH	260	0.52 (0.06,4.34)	0.544	
High RH	257	--	--	
Low plus High RH	517	0.30 (0.04,2.56)	0.273	

^a Relative risk and confidence interval relative to Comparisons.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

--: Adjusted relative risk, confidence interval, and p-value not presented due to the sparse number of abnormalities.

Note: RH = Ranch Hand.

Comparison: Current Dioxin \leq 10 ppt.

Background (Ranch Hand): Current Dioxin \leq 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin \leq 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

b) MODELS 4, 5, AND 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED				
Analysis Results for Log ₂ (Current Dioxin + 1)				
Model ^a	n	Adj. Relative Risk (95% C.I.) ^b	p-Value	Covariate Remarks
4	890	0.47 (0.19,1.15)	0.104	AGE (p=0.240)
5	890	0.64 (0.37,1.10)	0.152	AGE (p=0.232)
6 ^c	889	0.64 (0.36,1.13)	0.180	AGE (p=0.225)

^a Model 4: Log₂ (lipid-adjusted current dioxin + 1).

Model 5: Log₂ (whole-weight current dioxin + 1).

Model 6: Log₂ (whole-weight current dioxin + 1), adjusted for log₂ total lipids.

^b Relative risk for a twofold increase in current dioxin.

^c Adjusted for log₂ total lipids in addition to covariates specified under "Covariate Remarks" column.

Table G-3-13.
Analysis of Vibrotactile Threshold Measurement of Right Great Toe (microns)
Occupation and Diabetic Class Removed from Final Model

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED						
Initial Dioxin Category Summary Statistics			Analysis Results for Log ₂ (Initial Dioxin) ^b			
Initial Dioxin	n	Adj. Mean ^{ab}	R ²	Adj. Slope (Std. Error) ^c	p-Value	Covariate Remarks
Low	171	16.17**	0.146	0.0438 (0.0382)**	0.252**	INIT*HVMET (p=0.006)
Medium	167	22.33**				AGE (p<0.001)
High	165	18.43**				DRKYR (p=0.103) PWTOOL (p=0.196)

^a Transformed from natural logarithm scale.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^c Slope and standard error based on natural logarithm of vibrotactile threshold measurement of right great toe versus log₂ (initial dioxin).

** Log₂ (initial dioxin)-by-covariate interaction (p≤0.05); adjusted mean, adjusted slope, standard error, and p-value derived from a model fitted after deletion of this interaction; refer to Appendix Table G-4-3 for further analysis of this interaction.

Table G-3-13. (Continued)
Analysis of Vibrotactile Threshold Measurement of Right Great Toe (microns)
Occupation and Diabetic Class Removed from Final Model

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED					
Dioxin Category	n	Adj. Mean^{ab}	Difference of Adj. Mean vs. Comparisons (95% C.I.)^c	p-Value^d	Covariate Remarks
Comparison	1,041	17.48**			DXCAT*DRKYR (p=0.002) AGE (p<0.001) INS (p=0.576) HVMET (p=0.297)
Background RH	366	15.70**	-1.78--**	0.103**	
Low RH	253	17.47**	-0.01--**	0.994**	
High RH	250	19.29**	1.81--**	0.195**	
Low plus High RH	503	18.36**	0.88--**	0.402**	

^a Transformed from natural logarithm scale.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^c Difference of adjusted means after transformation to original scale; confidence interval on difference of adjusted means not presented because analysis was performed on natural logarithm scale.

^d P-value is based on difference of means on natural logarithm scale.

** Categorized dioxin-by-covariate interaction ($p \leq 0.05$); adjusted mean, difference of adjusted means, confidence interval, and p-value derived from a model fitted after deletion of this interaction; refer to Appendix Table G-4-3 for further analysis of this interaction.

Note: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, $10 \text{ ppt} < \text{Initial Dioxin} \leq 143$ ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table G-3-13. (Continued)
Analysis of Vibrotactile Threshold Measurement of Right Great Toe (microns)
Occupation and Diabetic Class Removed from Final Model

c) MODELS 4, 5, AND 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED							
Model ^b	Current Dioxin Category Adjusted Mean ^a /(n)			Analysis Results for Log ₂ (Current Dioxin + 1)			
	Low	Medium	High	R ²	Adj. Slope (Std. Error) ^c	p-Value	Covariate Remarks
4	14.90** (291)	18.33** (292)	19.71** (286)	0.158	0.0609 (0.0261)**	0.020**	CURR*DRKYR (p<0.001) CURR*HVMET (p=0.006) AGE (p<0.001) PWTOOL (p=0.421)
5	14.86** (295)	18.61** (289)	19.37** (285)	0.156	0.0498 (0.0222)**	0.025**	CURR*DRKYR (p=0.001) CURR*HVMET (p=0.021) AGE (p<0.001) PWTOOL (p=0.419)
6 ^d	14.95** (294)	18.68** (289)	19.55** (285)	0.155	0.0463 (0.0242)**	0.056**	CURR*DRKYR (p=0.001) CURR*HVMET (p=0.040) AGE (p<0.001) PWTOOL (p=0.409)

^a Transformed from natural logarithm scale.

^b Model 4: Log₂ (lipid-adjusted current dioxin + 1).

Model 5: Log₂ (whole-weight current dioxin + 1).

Model 6: Log₂ (whole-weight current dioxin + 1), adjusted for log₂ total lipids.

^c Slope and standard error based on natural logarithm of vibrotactile threshold measurement of right great toe versus log₂ (current dioxin + 1).

^d Adjusted for log₂ total lipids in addition to covariates specified under "Covariates Remarks" column.

** Log₂ (current dioxin + 1)-by-covariate interactions (p≤0.05); adjusted mean, adjusted slope, standard error, and p-value derived from a model fitted after deletion of these interactions; refer to Appendix Table G-4-3 for further analysis of these interactions.

Table G-3-14.
Analysis of Vibrotactile Threshold Measurement of Left Great Toe (microns)
Occupation and Diabetic Class Removed from Final Model

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED						
Initial Dioxin Category Summary Statistics			Analysis Results for Log ₂ (Initial Dioxin) ^b			
Initial Dioxin	n	Adj. Mean ^{ab}	R ²	Adj. Slope (Std. Error) ^c	p-Value	Covariate Remarks
Low	173	17.08**	0.179	0.0123 (0.0373)**	0.742**	INIT*HVMET (p=0.040)
Medium	172	18.11**				AGE (p<0.001)
High	170	17.21**				RACE (p=0.135)
						PWTOOL (p=0.020)

^a Transformed from natural logarithm scale.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^c Slope and standard error based on natural logarithm of vibrotactile threshold measurement of left great toe versus log₂ (initial dioxin).

** Log₂ (initial dioxin)-by-covariate interaction (0.01 < p ≤ 0.05); adjusted mean, adjusted slope, standard error, and p-value derived from a model fitted after deletion of this interaction; refer to Appendix Table G-4-4 for further analysis of this interaction.

Table G-3-14. (Continued)
Analysis of Vibrotactile Threshold Measurement of Left Great Toe (microns)
Occupation and Diabetic Class Removed from Final Model

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED					
Dioxin Category	n	Adj. Mean^{ab}	Difference of Adj. Mean vs. Comparisons (95% C.I.)^c	p-Value^d	Covariate Remarks
Comparison	1,042	16.00			AGE (p<0.001) RACE (p=0.306) DRKYR*INS (p=0.014)
Background RH	366	15.00	-1.00--	0.319	
Low RH	253	16.64	0.64--	0.600	
High RH	250	17.89	1.89--	0.137	
Low plus High RH	503	17.25	1.25--	0.192	

^a Transformed from natural logarithm scale.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^c Difference of adjusted means after transformation to original scale; confidence interval on difference of adjusted means not presented because analysis was performed on natural logarithm scale.

^d P-value is based on difference of means on natural logarithm scale.

Note: RH = Ranch Hand.

Comparison: Current Dioxin \leq 10 ppt.

Background (Ranch Hand): Current Dioxin \leq 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin \leq 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table G-3-14. (Continued)
Analysis of Vibrotactile Threshold Measurement of Left Great Toe (microns)
Occupation and Diabetic Class Removed from Final Model

c) MODELS 4, 5, AND 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED							
Model ^b	Current Dioxin Category Adjusted Mean ^a /(n)			Analysis Results for Log ₂ (Current Dioxin + 1)			
	Low	Medium	High	R ²	Adj. Slope (Std. Error) ^c	p-Value	Covariate Remarks
4	16.32** (291)	19.62** (292)	20.46** (286)	0.193	0.0547 (0.0257)**	0.034**	CURR*DRKYR (p=0.003) CURR*PWTOOL (p=0.039) AGE (p<0.001) HVMET (p=0.092)
5	16.29** (295)	19.53** (289)	20.49** (285)	0.193	0.0422 (0.0218)**	0.054**	CURR*DRKYR (p=0.001) CURR*PWTOOL (p=0.040) AGE (p<0.001) HVMET (p=0.085)
6 ^d	16.15** (294)	19.49** (289)	20.70** (285)	0.194	0.0454 (0.0238)**	0.057**	CURR*DRKYR (p=0.001) CURR*PWTOOL (p=0.036) AGE (p<0.001) HVMET (p=0.097)

^a Transformed from natural logarithm scale.

^b Model 4: Log₂ (lipid-adjusted current dioxin + 1).

Model 5: Log₂ (whole-weight current dioxin + 1).

Model 6: Log₂ (whole-weight current dioxin + 1), adjusted for log₂ total lipids.

^c Slope and standard error based on natural logarithm of vibrotactile threshold measurement of left great toe versus log₂ (current dioxin + 1).

^d Adjusted for log₂ total lipids in addition to covariates specified under "Covariates Remarks" column.

** Log₂ (current dioxin + 1)-by-covariate interactions (p≤0.05); adjusted mean, adjusted slope, standard error, and p-value derived from a model fitted after deletion of these interactions; refer to Appendix Table G-4-4 for further analysis of these interactions.

Table G-3-15.
Analysis of Tremor
Occupation and Diabetic Class Removed from Final Model

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED			
Analysis Results for Log ₂ (Initial Dioxin) ^a			
n	Adj. Relative Risk (95% C.I.)^b	p-Value	Covariate Remarks
517	1.42 (0.93,2.16)	0.113	AGE (p=0.090)

^a Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^b Relative risk for a twofold increase in initial dioxin.

b) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED				
Analysis Results for Log ₂ (Current Dioxin + 1)				
Model^a	n	Adj. Relative Risk (95% C.I.)^b	p-Value	Covariate Remarks
4	870	0.96 (0.72,1.28)**	0.793**	CURR*AGE (p=0.028) DRKYR (p=0.746)

^a Model 4: Log₂ (lipid-adjusted current dioxin + 1).

^b Relative risk for a twofold increase in current dioxin.

** Log₂ (current dioxin + 1)-by-covariate interaction (0.01 < p ≤ 0.05); adjusted relative risk, confidence interval, and p-value derived after deletion of this interaction; refer to Appendix Table G-4-5 for further analysis of this interaction.

Table G-3-16.
Analysis of Gait
Occupation and Diabetic Class Removed from Final Model

a) MODELS 4, 5, AND 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED				
Model ^a	Analysis Results for Log ₂ (Current Dioxin + 1)			
	n	Adj. Relative Risk (95% C.I.) ^b	p-Value	Covariate Remarks
4	890	1.05 (0.81,1.36)	0.705	AGE (p=0.113) INS (p=0.743)
5	890	1.05 (0.84,1.31)	0.648	AGE (p=0.111) INS (p=0.744)
6 ^c	889	1.04 (0.82,1.33)	0.730	AGE (p=0.117) INS (p=0.746)

^a Model 4: Log₂ (lipid-adjusted current dioxin + 1).
Model 5: Log₂ (whole-weight current dioxin + 1).
Model 6: Log₂ (whole-weight current dioxin + 1), adjusted for log₂ total lipids.

^b Relative risk for a twofold increase in current dioxin.

^c Adjusted for log₂ total lipids in addition to covariates specified under "Covariate Remarks" column.

Table G-3-17.
Analysis of Central Nervous System (CNS) Index
Occupation Removed from Final Model

a) MODELS 4, 5, AND 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED				
Analysis Results for Log_2 (Current Dioxin + 1)				
Model ^a	n	Adj. Relative Risk (95% C.I.) ^b	p-Value	Covariate Remarks
4	889	1.04 (0.85,1.27)	0.689	AGE (p=0.074) INS (p=0.394)
5	889	1.06 (0.89,1.26)	0.504	AGE (p=0.066) INS (p=0.397)
6 ^c	888	1.02 (0.84,1.22)	0.867	AGE (p=0.088) INS (p=0.392)

^a Model 4: Log_2 (lipid-adjusted current dioxin + 1).
Model 5: Log_2 (whole-weight current dioxin + 1).
Model 6: Log_2 (whole-weight current dioxin + 1), adjusted for log_2 total lipids.

^b Relative risk for a twofold increase in current dioxin.

^c Adjusted for log_2 total lipids in addition to covariates specified under "Covariate Remarks" column.

APPENDIX G-4.

Interaction Tables for the Neurology Assessment Occupation and Diabetic Class Removed from Final Model

This appendix contains exposure analyses results of interactions between covariates and dioxin after occupation and diabetic class have been removed from those final dioxin models (Models 2 through 6) that contained occupation or diabetic class. These tables are supplements to tables in Appendix G-3, which are main effects results with occupation and diabetic class removed from the model. Results are presented for separate strata of the covariate and include sample sizes, percent abnormal, relative risks, confidence intervals, and p-values. Chapter 7, Statistical Methods, provides further details on the analytical approaches used in the interaction analyses. The analysis model, covariate involved in the interaction, and a reference to the analysis table in Chapter 11 are given in the heading of each subtable. A summary of the interactions described in this appendix follows.

Appendix G-4 Table	Chapter 11 Table	Appendix G-3 Table	Dependent Variable	Model	Covariate
G-4-1	11-5	G-3-2	Peripheral Disorders	4 5 6	Lifetime Alcohol History Lifetime Alcohol History Lifetime Alcohol History
G-4-2	11-25	G-3-10	Achilles Reflex	2 3	Lifetime Alcohol History Lifetime Alcohol History
G-4-3	11-28	G-3-13	Vibrotactile Threshold Measurement of Right Great Toe	2 3 4 5 6	Composite Exposure to Heavy Metals Lifetime Alcohol History Lifetime Alcohol History, Composite Exposure to Heavy Metals Lifetime Alcohol History, Composite Exposure to Heavy Metals Lifetime Alcohol History, Composite Exposure to Heavy Metals
G-4-4	11-29	G-3-14	Vibrotactile Threshold Measurement of Left Great Toe	2 4 5 6	Composite Exposure to Heavy Metals Lifetime Alcohol History, Worked with Vibrating Power Equipment or Tools Lifetime Alcohol History, Worked with Vibrating Power Equipment or Tools Lifetime Alcohol History, Worked with Vibrating Power Equipment or Tools
G-4-5	11-30	G-3-15	Tremor	4	Age

Table G-4-1.
Interaction Table for Peripheral Disorders
Occupation and Diabetic Class Removed from Final Model

a) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Lifetime Alcohol History: Tables 11-5 and G-3-2)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent Yes	Adjusted Relative Risk (95% C.I.) ^a	p-Value
0 Drink-years	Low	17	5.9	1.34 (0.82,2.19)	0.248
	Medium	18	22.2		
	High	24	20.8		
>0-40 Drink-years	Low	205	10.2	1.29 (1.10,1.52)	0.002
	Medium	195	20.0		
	High	190	19.5		
>40 Drink-years	Low	67	22.4	0.82 (0.64,1.06)	0.135
	Medium	78	24.4		
	High	73	15.1		

b) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Lifetime Alcohol History: Tables 11-5 and G-3-2)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent Yes	Adjusted Relative Risk (95% C.I.) ^a	p-Value
0 Drink-years	Low	18	5.6	1.37 (0.91,2.07)	0.136
	Medium	14	21.4		
	High	27	22.2		
>0-40 Drink-years	Low	206	11.7	1.25 (1.08,1.43)	0.002
	Medium	201	17.9		
	High	183	20.2		
>40 Drink-years	Low	68	20.6	0.87 (0.71,1.05)	0.148
	Medium	75	25.3		
	High	75	16.0		

Table G-4-1. (Continued)
Interaction Table for Peripheral Disorders
Occupation and Diabetic Class Removed from Final Model

c) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Lifetime Alcohol History: Tables 11-5 and G-3-2)					
Current Dioxin Category Summary Statistics				Analysis Results for Log _e (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent Yes	Adjusted Relative Risk (95% C.I.) ^a	p-Value
0 Drink-years	Low	18	5.6	1.40 (0.92,2.13)	0.116
	Medium	14	21.4		
	High	27	22.2		
> 0-40 Drink-years	Low	206	11.7	1.27 (1.09,1.48)	0.002
	Medium	201	17.9		
	High	183	20.2		
> 40 Drink-years	Low	68	20.6	0.88 (0.72,1.08)	0.224
	Medium	75	25.3		
	High	75	16.0		

^a Relative risk for a twofold increase in current dioxin.

Note: Model 4: Low = ≤ 8.1 ppt; Medium = > 8.1-20.5 ppt; High = > 20.5 ppt.

Models 5 and 6: Low = ≤ 46 ppq; Medium = > 46-128 ppq; High = > 128 ppq.

Table G-4-2.
Interaction Table for Achilles Reflex
Occupation and Diabetic Class Removed from Final Model

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Lifetime Alcohol History: Tables 11-25 and G-3-10)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Initial Dioxin)	
Stratum	Initial Dioxin	n	Percent Abnormal	Adjusted Relative Risk (95% C.I.) ^a	p-Value
0 Drink-years	Low	10	0.0	1.88 (0.96,3.68)	0.066
	Medium	12	16.7		
	High	17	29.4		
>0-40 Drink-years	Low	118	10.2	1.02 (0.76,1.37)	0.919
	Medium	108	13.0		
	High	105	6.7		
>40 Drink-years	Low	42	14.3	0.86 (0.51,1.46)	0.586
	Medium	48	4.2		
	High	43	7.0		

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Lifetime Alcohol History: Tables 11-25 and G-3-10)					
Stratum	Dioxin Category	n	Percent Abnormal	Adjusted Relative Risk (95% C.I.) ^b	p-Value
0 Drink-years	Comparison	54	7.4		
	Background RH	20	0.0	--	--
	Low RH	15	6.7	0.94 (0.10,9.15)	0.957
	High RH	24	25.0	4.27 (1.06,17.22)	0.041
	Low plus High RH	39	18.0	2.81 (0.75,10.47)	0.124
>0-40 Drink-years	Comparison	706	8.1		
	Background RH	258	8.5	1.03 (0.61,1.74)	0.914
	Low RH	169	10.7	1.12 (0.63,1.99)	0.688
	High RH	162	9.3	1.32 (0.71,2.46)	0.373
	Low plus High RH	331	10.0	1.21 (0.76,1.92)	0.423
>40 Drink-years	Comparison	281	11.7		
	Background RH	86	12.8	1.14 (0.54,2.39)	0.731
	Low RH	69	11.6	0.93 (0.40,2.14)	0.862
	High RH	64	4.7	0.40 (0.12,1.39)	0.144
	Low plus High RH	133	8.3	0.68 (0.33,1.41)	0.302

^a Relative risk for a twofold increase in initial dioxin.

^b Relative risk and confidence interval relative to Comparisons.

--: Adjusted relative risk, confidence interval, and p-value not presented due to the sparse number of abnormalities.

Note: Model 2: Low = 39-98 ppt; Medium = > 98-232 ppt; High = > 232 ppt.

Model 3: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table G-4-3.

**Interaction Table for Vibrotactile Threshold Measurement of Right Great Toe (microns)
Occupation and Diabetic Class Removed from Final Model**

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Composite Exposure to Heavy Metals: Tables 11-28 and G-3-13)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log _e (Initial Dioxin)	
Stratum	Initial Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
No	Low	142	15.67	-0.0039 (0.0417)	0.926
	Medium	140	21.19		
	High	129	15.71		
Yes	Low	29	13.78	0.2477 (0.0825)	0.003
	Medium	27	20.97		
	High	36	27.35		

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Lifetime Alcohol History: Tables 11-28 and G-3-13)					
Stratum	Dioxin Category	n	Adjusted Mean ^a	Difference of Adjusted Mean vs. Comparisons (95% C.I.) ^c	p-Value ^d
0 Drink-years	Comparison	54	12.38		
	Background RH	20	14.88	2.50 --	0.507
	Low RH	15	18.45	6.07 --	0.196
	High RH	24	23.43	11.05 --	0.014
	Low plus High RH	39	21.52	9.14 --	0.014
>0-40 Drink-years	Comparison	706	17.91		
	Background RH	260	14.05	-3.86 --	0.002
	Low RH	169	18.47	0.56 --	0.737
	High RH	162	18.11	0.20 --	0.907
	Low plus High RH	331	18.29	0.38 --	0.768
>40 Drink-years	Comparison	281	17.55		
	Background RH	86	22.22	4.66 --	0.071
	Low RH	69	15.04	-2.52 --	0.277
	High RH	64	21.03	3.48 --	0.218
	Low plus High RH	133	17.92	0.37 --	0.951

Table G-4-3. (Continued)
Interaction Table for Vibrotactile Threshold Measurement of Right Great Toe (microns)
Occupation and Diabetic Class Removed from Final Model

c) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Lifetime Alcohol History: Tables 11-28 and G-3-13)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
0 Drink-years	Low	17	14.25	0.1326 (0.0864)	0.125
	Medium	18	16.41		
	High	24	27.66		
> 0-40 Drink-years	Low	206	13.47	0.0876 (0.0321)	0.007
	Medium	196	18.56		
	High	189	18.68		
> 40 Drink-years	Low	68	20.56	-0.0382 (0.0503)	0.447
	Medium	78	18.49		
	High	73	20.47		

d) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Composite Exposure to Heavy Metals: Tables 11-28 and G-3-13)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
No	Low	254	14.65	0.0322 (0.0283)	0.255
	Medium	246	17.96		
	High	235	18.03		
Yes	Low	37	13.19	0.2120 (0.0634)	<0.001
	Medium	46	17.08		
	High	51	25.75		

e) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Lifetime Alcohol History: Tables 11-28 and G-3-13)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
0 Drink-years	Low	18	16.20	0.1022 (0.0719)	0.156
	Medium	14	15.24		
	High	27	27.83		
> 0-40 Drink-years	Low	208	13.17	0.0802 (0.0278)	0.004
	Medium	200	18.98		
	High	183	18.57		
> 40 Drink-years	Low	69	21.03	-0.0420 (0.0416)	0.313
	Medium	75	18.51		
	High	75	19.84		

Table G-4-3. (Continued)
Interaction Table for Vibrotactile Threshold Measurement of Right Great Toe (microns)
Occupation and Diabetic Class Removed from Final Model

f) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Composite Exposure to Heavy Metals: Tables 11-28 and G-3-13)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
No	Low	259	14.42	0.0288 (0.0240)	0.230
	Medium	244	18.17		
	High	232	18.01		
Yes	Low	36	14.33	0.1657 (0.0554)	0.003
	Medium	45	17.59		
	High	53	23.21		

g) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Lifetime Alcohol History: Tables 11-28 and G-3-13)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
0 Drink-years	Low	18	16.19	0.1021 (0.0726)	0.160
	Medium	14	15.26		
	High	27	25.04		
>0-40 Drink-years	Low	207	13.27	0.0753 (0.0297)	0.011
	Medium	200	19.06		
	High	183	18.73		
>40 Drink-years	Low	69	21.05	-0.0424 (0.0426)	0.320
	Medium	75	18.55		
	High	75	20.01		

Table G-4-3. (Continued)
Interaction Table for Vibrotactile Threshold Measurement of Right Great Toe (microns)
Occupation and Diabetic Class Removed from Final Model

h) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Composite Exposure to Heavy Metals: Tables 11-28 and G-3-13)					
Current Dioxin Category Summary Statistics				Analysis Results for Log _e (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
No	Low	259	14.38	0.0294 (0.0256)	0.251
	Medium	244	18.19		
	High	232	18.13		
Yes	Low	35	14.85	0.1551 (0.0599)	0.010
	Medium	45	17.56		
	High	53	23.32		

^a Transformed from natural logarithm scale.

^b Slope and standard error based on natural logarithm of vibrotactile threshold measurement of right great toe versus log_e dioxin.

^c Difference of means after transformation to original scale; confidence interval on difference of means not presented because analysis was performed on natural logarithm scale.

^d P-value is based on difference of means on natural logarithm scale.

Note: Model 2: Low = 39-98 ppt; Medium = > 98-232 ppt; High = > 232 ppt.

Model 3: Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Model 4: Low = ≤ 8.1 ppt; Medium = > 8.1-20.5 ppt; High = > 20.5 ppt.

Models 5 and 6: Low = ≤ 46 ppq; Medium = > 46-128 ppq; High = > 128 ppq.

Table G-4-4.

**Interaction Table for Vibrotactile Threshold Measurement of Left Great Toe (microns)
Occupation and Diabetic Class Removed from Final Model**

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Composite Exposure to Heavy Metals: Tables 11-29 and G-3-14)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Initial Dioxin)	
Stratum	Initial Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
No	Low	144	16.56	-0.0220 (0.0407)	0.589
	Medium	144	16.83		
	High	134	15.02		
Yes	Low	29	14.60	0.1619 (0.0815)	0.048
	Medium	28	19.22		
	High	36	23.64		

b) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Lifetime Alcohol History: Tables 11-29 and G-3-14)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
0 Drink-years	Low	17	22.72	0.0149 (0.0851)	0.861
	Medium	18	15.55		
	High	24	23.37		
>0-40 Drink-years	Low	206	14.67	0.0876 (0.0317)	0.006
	Medium	196	19.75		
	High	189	19.93		
>40 Drink-years	Low	68	20.82	-0.0191 (0.0496)	0.700
	Medium	78	20.63		
	High	73	21.33		

c) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Worked with Vibrating Power Equipment or Tools: Tables 11-29 and G-3-14)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
No	Low	232	16.39	0.0233 (0.0300)	0.437
	Medium	223	19.33		
	High	201	18.51		
Yes	Low	59	14.58	0.1356 (0.0477)	0.005
	Medium	69	19.18		
	High	85	24.78		

Table G-4-4. (Continued)
Interaction Table for Vibrotactile Threshold Measurement of Left Great Toe (microns)
Occupation and Diabetic Class Removed from Final Model

d) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Lifetime Alcohol History: Tables 11-29 and G-3-14)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
0 Drink-years	Low	18	20.70	0.0083 (0.0709)	0.906
	Medium	14	17.92		
	High	27	21.59		
>0-40 Drink-years	Low	208	14.59	0.0781 (0.0274)	0.004
	Medium	200	19.40		
	High	183	20.30		
>40 Drink-years	Low	69	21.37	-0.0311 (0.0410)	0.448
	Medium	75	20.38		
	High	75	20.89		

e) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Worked with Vibrating Power Equipment or Tools: Tables 11-29 and G-3-14)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
No	Low	241	16.44	0.0149 (0.0256)	0.561
	Medium	214	19.34		
	High	201	18.42		
Yes	Low	54	14.05	0.1107 (0.0404)	0.006
	Medium	75	18.98		
	High	84	25.14		

Table G-4-4. (Continued)
Interaction Table for Vibrotactile Threshold Measurement of Left Great Toe (microns)
Occupation and Diabetic Class Removed from Final Model

f) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Lifetime Alcohol History: Tables 11-29 and G-3-14)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
0 Drink-years	Low	18	20.41	0.0117 (0.0716)	0.871
	Medium	14	17.79		
	High	27	21.75		
>0-40 Drink-years	Low	207	14.47	0.0820 (0.0293)	0.005
	Medium	200	19.37		
	High	183	20.47		
>40 Drink-years	Low	69	21.18	-0.0281 (0.0420)	0.503
	Medium	75	20.33		
	High	75	21.09		

g) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Worked with Vibrating Power Equipment or Tools: Tables 11-29 and G-3-14)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
No	Low	241	16.30	0.0178 (0.0274)	0.516
	Medium	214	19.31		
	High	201	18.57		
Yes	Low	53	13.98	0.1169 (0.0424)	0.006
	Medium	75	18.92		
	High	84	25.28		

^a Transformed from natural logarithm scale.

^b Slope and standard error based on natural logarithm of vibrotactile threshold measurement of left great toe versus log₂ dioxin.

Note: Model 2: Low = 39-98 ppt; Medium = > 98-232 ppt; High = > 232 ppt.

Model 4: Low = ≤ 8.1 ppt; Medium = > 8.1-20.5 ppt; High = > 20.5 ppt.

Models 5 and 6: Low = ≤ 46 ppq; Medium = > 46-128 ppq; High = > 128 ppq.

Table G-4-5.
Interaction Table for Tremor
Occupation and Diabetic Class Removed from Final Model

a) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Age: Tables 11-30 and G-3-15)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent Abnormal	Adjusted Relative Risk (95% C.I.) ^a	p-Value
Born ≥ 1942	Low	97	4.1	0.70 (0.46,1.07)	0.104
	Medium	95	3.2		
	High	164	1.8		
Born < 1942	Low	194	3.6	1.28 (0.87,1.89)	0.207
	Medium	197	0.0		
	High	123	5.7		

^a Relative risk for a twofold increase in current dioxin.

Note: Model 4: Low = ≤ 8.1 ppt; Medium = > 8.1-20.5 ppt; High = > 20.5 ppt.

APPENDIX G-5.

Analysis of Smile, Speech, and Tremor Model 1: Enlisted Flyers and Enlisted Groundcrew Combined

The statistical power to detect a relative risk (Ranch Hands versus Comparisons) significantly different from 1.0 is limited in some analyses in Chapter 11, Neurological Assessment, due to the relatively small number of abnormalities. In particular, the number of abnormalities in the enlisted flyer stratum for Model 1 analyses is small. Consequently, auxiliary analyses with the enlisted flyer and enlisted groundcrew strata combined are presented for smile (Table 13-13), speech (Table 13-17), and tremor (Table 13-30). The p-values for the Model 1 analyses of these three variables were not significant ($p > 0.10$) for the enlisted flyer and enlisted groundcrew strata when analyzed separately, but marginally significant ($0.05 \leq p < 0.10$) when the two strata were combined. These auxiliary analyses are found in Table G-5-1 (smile), Table G-5-2 (speech), and Table G-5-3 (tremor).

Table G-5-1.
Analysis of Smile
Enlisted Flyers and Enlisted Groundcrew Combined

a) MODEL 1: RANCH HANDS VS. COMPARISONS — UNADJUSTED					
Occupational Category	Group	n	Percent Abnormal	Est. Relative Risk (95% C.I.)	p-Value
<i>All</i>	<i>Ranch Hand</i>	<i>948</i>	<i>0.9</i>	<i>1.52 (0.59,3.97)</i>	<i>0.533</i>
	<i>Comparison</i>	<i>1,280</i>	<i>0.6</i>		
Officer	Ranch Hand	367	0.8	0.58 (0.15,2.26)	0.639
	Comparison	501	1.4		
Enlisted Flyer and Enlisted Groundcrew	Ranch Hand	581	1.0	8.12 (0.98,67.62)	0.055
	Comparison	779	0.1		

b) MODEL 1: RANCH HANDS VS. COMPARISONS — ADJUSTED			
Occupational Category	Adj. Relative Risk (95% C.I.)	p-Value	Covariate Remarks^a
<i>All</i>	<i>1.53 (0.59,3.99)</i>	<i>0.383</i>	OCC (p=0.096)
Officer	0.58 (0.15,2.26)	0.639	
Enlisted Flyer and Enlisted Groundcrew	8.12 (0.98,67.62)	0.055	

^a Covariates and associated p-values correspond to final model based on all participants with available data.

Table G-5-2.
Analysis of Speech
Enlisted Flyers and Enlisted Groundcrew Combined

a) MODEL 1: RANCH HANDS VS. COMPARISONS — UNADJUSTED					
Occupational Category	Group	n	Percent Abnormal	Est. Relative Risk (95% C.I.)	p-Value
<i>All</i>	<i>Ranch Hand</i>	<i>948</i>	<i>0.6</i>	<i>4.07 (0.82,20.21)</i>	<i>0.133</i>
	<i>Comparison</i>	<i>1,280</i>	<i>0.2</i>		
Officer	Ranch Hand	367	0.3	1.37 (0.09,21.91)	0.999
	Comparison	501	0.2		
Enlisted Flyer and Enlisted Groundcrew	Ranch Hand	581	0.9	6.75 (0.79,57.96)	0.109
	Comparison	779	0.1		

b) MODEL 1: RANCH HANDS VS. COMPARISONS — ADJUSTED			
Occupational Category	Adj. Relative Risk (95% C.I.)	p-Value	Covariate Remarks^a
<i>All</i>	<i>3.98 (0.80,19.91)</i>	<i>0.068</i>	AGE (p=0.001) OCC (p=0.108)
Officer	1.40 (0.09,22.61)	0.813	
Enlisted Flyer and Enlisted Groundcrew	6.55 (0.74,57.62)	0.090	

^a Covariates and associated p-values correspond to final model based on all participants with available data.

Table G-5-3.
Analysis of Tremor
Enlisted Flyers and Enlisted Groundcrew Combined

a) MODEL 1: RANCH HANDS VS. COMPARISONS — UNADJUSTED					
Occupational Category	Group	n	Percent Abnormal	Est. Relative Risk (95% C.I.)	p-Value
<i>All</i>	<i>Ranch Hand</i>	<i>948</i>	<i>3.0</i>	<i>1.12 (0.67,1.85)</i>	<i>0.771</i>
	<i>Comparison</i>	<i>1,280</i>	<i>2.7</i>		
Officer	Ranch Hand	367	2.2	0.54 (0.23,1.23)	0.194
	Comparison	501	4.0		
Enlisted Flyer and Enlisted Groundcrew	Ranch Hand	581	3.4	1.95 (0.98,3.89)	0.081
	Comparison	779	1.8		

b) MODEL 1: RANCH HANDS VS. COMPARISONS — ADJUSTED			
Occupational Category	Adj. Relative Risk (95% C.I.)	p-Value	Covariate Remarks^a
<i>All</i>	<i>1.09 (0.65,1.83)**</i>	<i>0.755**</i>	GROUP*OCC (p=0.029) AGE*DRKYR (p=0.038)
Officer	0.55 (0.24,1.28)	0.166	
Enlisted Flyer and Enlisted Groundcrew	1.83 (0.90,3.69)	0.094	

^a Covariates and associated p-values correspond to final model based on all participants with available data.

** Group-by-covariate interaction ($0.01 < p \leq 0.05$); adjusted relative risk, confidence interval, and p-value derived from a model fitted after deletion of this interaction.

APPENDIX H-1.

Primary Symptom Disease Categories and Global Indices of Distress Definitions and Dependent Variable-Covariate Associations for the Psychological Assessment

The first part of this appendix contains a description of the nine primary symptom disease categories and the three global indices of distress derived from the Symptom Check List-90-Revised (SCL-90-R) multidimensional self-reported symptom inventory (35). Responses to the inventory are grouped into nine primary symptom categories: anxiety, depression, hostility, interpersonal sensitivity, obsessive-compulsive behavior, paranoid ideation, phobic anxiety, psychoticism, and somatization. Three global indices also are constructed from this inventory: the global severity index (GSI), the positive symptom total (PST), and the positive symptom distress index (PSDI). The GSI is defined as the sum of the scores of all answered questions divided by the number of answered questions on the entire test. This index combines information on the number of symptoms and the intensity of distress. The PST is the number of questions to which the participant responds positively (i.e., on the 5-point scale, responses 1=a little bit, 2=moderately, 3=quite a bit, 4=extremely). The PSDI is determined by adding the scores of all answered questions and dividing by the PST. This index describes the intensity of the positive symptoms.

Also included in this appendix is Table H-1-1, which contains results of tests of association between each dependent variable and candidate covariates for the adjusted analysis. Pearson's chi-square test (continuity-adjusted for 2x2 tables) is used for the significance testing of the association between each dependent variable and the candidate covariate. When a candidate covariate is continuous in nature (e.g., age), the covariate is discretized prior to the analysis of the dependent variable.

DESCRIPTION OF SCL-90-R DIMENSIONS*

ANXIETY

The anxiety dimension is composed of a set of symptoms and signs that are associated clinically with high levels of manifest anxiety. General signs such as nervousness, tension, and trembling are included in the definition, as are panic attacks and feelings of terror. Cognitive components involving feelings of apprehension and dread, and some of the somatic correlates of anxiety also are included as dimensional components. The symptoms comprising the anxiety dimension are experiencing nervousness or shakiness inside, trembling, being suddenly scared for no reason, feeling fearful, experiencing heart pounding or racing, feeling tense and keyed up, keying spells of terror and panic, feeling so restless you couldn't sit still, feeling that something bad is going to happen, and experiencing frightening thoughts and images.

DEPRESSION

The symptoms of the depression dimension reflect a broad range of the manifestations of clinical depression. Symptoms of dysphoric mood and affect are represented, as are signs of withdrawal of life interest, lack of motivation, and loss of vital energy. In addition, feelings of hopelessness, thoughts of suicide, and other cognitive and somatic correlates of depression are included. The symptoms comprising the depression dimension are losing sexual interest or pleasure, feeling low in energy or slowed down, thinking of ending your life, crying easily, feeling trapped or caught, blaming yourself for things, feeling lonely, feeling blue, worrying too much about things, feeling no interest in things, feeling hopeless about the future, feeling everything is an effort, and feeling worthless.

HOSTILITY

The hostility dimension reflects thoughts, feelings, or actions that are characteristic of the negative affect state of anger. The selection of items includes all three modes of manifestation and reflects qualities such as aggression, irritability, rage, and resentment. The symptoms comprising the hostility dimension are feeling easily annoyed or irritated; having uncontrollable temper outbursts; having urges to beat, injure, or harm someone; having urges to break or smash things; getting into frequent arguments; and shouting or throwing things.

INTERPERSONAL SENSITIVITY

The interpersonal sensitivity dimension focuses on feelings of personal inadequacy and inferiority, particularly in comparison with others. Self-deprecation, feelings of uneasiness, and marked discomfort during interpersonal interactions are characteristic manifestations of this syndrome. In addition, individuals with high scores on interpersonal sensitivity report acute self-consciousness and negative expectations concerning the communications and

* Taken from the SCL-90-R (35).

interpersonal behaviors with others. The symptoms comprising the interpersonal sensitivity dimension are feeling critical of others, feeling shy or uneasy with the opposite sex, having feelings easily hurt, feeling others do not understand or are unsympathetic, feeling that people are unfriendly or dislike you, feeling inferior to others, feeling uneasy when people are watching or talking about you, feeling very self-conscious with others, and feeling uncomfortable about eating or drinking in public.

OBSESSIVE-COMPULSIVE

The obsessive-compulsive dimension reflects symptoms that are highly identified with the standard clinical syndrome of the same name. This measure focuses on thoughts, impulses, and actions that are experienced as unremitting and irresistible by the individual but are of an ego-alien or unwanted nature. Behaviors and experiences of a more general cognitive performance attenuation also are included in this measure. The symptoms comprising the obsessive-compulsive dimension are experiencing repeated unpleasant thoughts that won't leave the mind, having trouble remembering things, worrying about sloppiness or carelessness, feeling blocked in getting things done, having to do things very slowly to ensure correctness, having to check and double-check what is done, having difficulty making decisions, having mind go blank, having trouble concentrating, and having to repeat the same actions (e.g., touching, counting, washing).

PARANOID IDEATION

The present dimension represents paranoid behavior fundamentally as a disordered mode of thinking. The cardinal characteristics of projective thought, hostility, suspiciousness, grandiosity, centrality, fear of loss of autonomy, and delusions are viewed as primary reflections of this disorder; item selection was oriented toward representing this conceptualization. The symptoms comprising the paranoid ideation dimension are feeling others are to blame for most of your troubles, feeling that most people cannot be trusted, feeling that you are watched or talked about by others, having ideas and beliefs that others do not share, not receiving proper credit from others for your achievements, and feeling that people will take advantage of you if you let them.

PHOBIC ANXIETY

Phobic anxiety is defined as a persistent fear response to a specific person, place, object, or situation that is characterized as being irrational and disproportionate to the stimulus, and which leads to avoidance or escape behavior. The items of the present dimension focus on the more pathognomic and disruptive manifestations of phobic behavior. The actual structure of the dimension is in close agreement with the definition of "agoraphobia" (Marks, 1969), also termed "phobic anxiety depersonalization syndrome" by Roth (1959). The symptoms comprising the phobic anxiety dimension are feeling afraid in open spaces or on the street; feeling afraid to go out of the house alone; feeling afraid to travel on buses, subways, or trains; having to avoid certain things, places, or activities because they are frightening; feeling uneasy in crowds, such as shopping or at a movie; feeling nervous when left alone; and feeling afraid of fainting in public.

PSYCHOTICISM

The psychoticism scale was developed in a fashion to represent the construct as a continuous dimension of human experience. Items indicative of a withdrawn, isolated, schizoid lifestyle were included, as were first-rank symptoms of schizophrenia, such as hallucinations and thought-broadcasting. The psychoticism scale provides a graduated continuum from mild interpersonal alienation to dramatic evidence of psychosis. In this respect, the present definition owes much to the work of Eysenck (1968). The symptoms comprising the psychoticism dimension are having the idea that someone else can control your thoughts, hearing voices that other people do not hear, believing that other people are aware of your private thoughts, having thoughts that are not your own, feeling lonely even when you are with people, having thoughts about sex that bother you a lot, believing that you should be punished for your sins, thinking that something serious is wrong with your body, never feeling close to another person, and thinking that something is wrong with your mind.

SOMATIZATION

The somatization dimension reflects distress arising from perceptions of bodily dysfunction. Complaints focusing on cardiovascular, gastrointestinal, respiratory, and other systems with strong autonomic mediation are included. Headaches, pain, and discomfort of the gross musculature and additional somatic equivalents of anxiety are components of the definition. These symptoms and signs have all been demonstrated to have high prevalence in disorders demonstrated to have a functional etiology, although all may be reflections of true physical disease. The symptoms comprising the somatization dimension are headaches, faintness or dizziness, pains in heart or chest, pains in lower back, nausea or upset stomach, soreness of muscles, trouble getting breath, hot or cold spells, numbness or tingling in parts of body, lump in throat, weakness in parts of body, and heavy feelings in arms or legs.

ADDITIONAL ITEMS

Seven items are a part of the SCL-90-R, which are not subsumed under any of the primary symptom dimensions; these symptoms actually "load" on several of the dimensions but are not univocal to any of them. While in this sense they violate one of the statistical criteria for inclusion in the test, they are a part of the item set because they are clinically important. These items contribute to the global scores on the SCL-90-R and are intended to be used configurally. Thus, a high depression score with "early morning awakening" and "poor appetite" may mean something quite different from a similar score with these symptoms absent. By the same token, the presence of conscious "feelings of guilt" is an important clinical indicator that communicates important information to the clinician. The additional items are not scored collectively as a dimension but are summed into the global scores. The additional items in the SCL-90-R are having a poor appetite, overeating, having trouble falling asleep, awakening in the early morning, experiencing restless or disturbed sleep, thinking of death or dying, and feeling guilty.

THE GLOBAL INDICES OF DISTRESS

There are three global indices of distress associated with the SCL-90-R: the GSI, the

PSDI, and the PST. The function of each of these global measures is to communicate in a single score the level or depth of the individual's psychopathology. Each measure does this in a somewhat distinct fashion and reflects somewhat different aspects of psychopathology (Derogatis, Yevzeroff, & Wittelsberger, 1975). The GSI represents the best single indicator of the current level or depth of the disorder and should be utilized in most instances where a single summary measure is required. The GSI combines information on numbers of symptoms and intensity of perceived distress. The PSDI is a pure intensity measure, in a sense, "corrected" for numbers of symptoms. It functions very much as a measure of response style in the sense of communicating whether the patient is "augmenting" or "attenuating" symptomatic distress in his style of reporting his disorder. The PST is simply a count of the number of symptoms the patient reports as positive—that is, that he experiences as having to any degree. When used configurally in conjunction with the GSI, information on style of response and numbers of symptoms endorsed can be very helpful in appreciating the clinical picture.

Table H-1-1.
Dependent Variable-Covariate Associations for the Psychological Assessment

Dependent Variable	Level	Age			Race		
		Born ≥1942	Born <1942	p-Value	Black	Non-Black	p-Value
Psychoses	Yes	(n=952) 3.3%	(n=1,277) 2.6%	0.417	(n=131) 1.5%	(n=2,098) 3.0%	0.496
Alcohol Dependence	Yes	(n=951) 6.4%	(n=1,277) 7.4%	0.433	(n=130) 10.8%	(n=2,098) 6.7%	0.113
Drug Dependence	Yes	(n=952) 0.4%	(n=1,277) 0.1%	0.217	(n=131) 0.8%	(n=2,098) 0.2%	0.695
Anxiety	Yes	(n=949) 16.2%	(n=1,272) 13.1%	0.041	(n=131) 12.2%	(n=2,090) 14.6%	0.543
Other Neuroses	Yes	(n=943) 38.1%	(n=1,261) 38.4%	0.916	(n=130) 38.5%	(n=2,074) 38.2%	0.999
SCL-90-R Anxiety	High	(n=952) 7.5%	(n=1,275) 6.0%	0.214	(n=131) 8.4%	(n=2,096) 6.5%	0.517
SCL-90-R Depression	High	(n=952) 9.7%	(n=1,275) 9.2%	0.751	(n=131) 9.2%	(n=2,096) 9.4%	0.999
SCL-90-R Hostility	High	(n=952) 5.9%	(n=1,275) 4.3%	0.113	(n=131) 5.3%	(n=2,096) 5.0%	0.999
SCL-90-R Interpersonal Sensitivity	High	(n=952) 11.7%	(n=1,275) 8.2%	0.009	(n=131) 11.5%	(n=2,096) 9.6%	0.585
SCL-90-R Obsessive-Compulsive Behavior	High	(n=952) 9.6%	(n=1,275) 9.7%	0.953	(n=131) 9.2%	(n=2,096) 9.7%	0.964
SCL-90-R Paranoid Ideation	High	(n=952) 6.6%	(n=1,275) 4.9%	0.092	(n=131) 10.7%	(n=2,096) 5.3%	0.016
SCL-90-R Phobic Anxiety	High	(n=952) 9.4%	(n=1,275) 7.3%	0.094	(n=131) 13.0%	(n=2,096) 7.9%	0.057
SCL-90-R Psychoticism	High	(n=952) 9.0%	(n=1,275) 9.3%	0.916	(n=131) 14.5%	(n=2,096) 8.8%	0.042
SCL-90-R Somatization	High	(n=952) 8.7%	(n=1,275) 8.9%	0.965	(n=131) 13.0%	(n=2,096) 8.5%	0.114
SCL-90-R Global Severity Index	High	(n=952) 9.4%	(n=1,275) 8.1%	0.327	(n=131) 13.0%	(n=2,096) 8.4%	0.095
SCL-90-R Positive Symptom Total	High	(n=952) 10.8%	(n=1,275) 9.7%	0.439	(n=131) 14.5%	(n=2,096) 9.9%	0.126
SCL-90-R Positive Symptom Distress Index	High	(n=952) 7.0%	(n=1,275) 8.1%	0.404	(n=131) 8.4%	(n=2,096) 7.6%	0.865

Table H-1-1. (Continued)
Dependent Variable-Covariate Associations for the Psychological Assessment

Dependent Variable	Level	Occupation			p-Value
		Officer	Enlisted Flyer	Enlisted Groundcrew	
Psychoses	Yes	(n=868) 2.0%	(n=365) 3.0%	(n=996) 3.6%	0.101
Alcohol Dependence	Yes	(n=868) 5.0%	(n=365) 9.0%	(n=995) 7.9%	0.009
Drug Dependence	Yes	(n=868) 0.1%	(n=365) 0.0%	(n=996) 0.4%	0.262
Anxiety	Yes	(n=867) 6.6%	(n=364) 16.8%	(n=990) 20.4%	<0.001
Other Neuroses	Yes	(n=863) 29.1%	(n=360) 45.6%	(n=981) 43.6%	<0.001
SCL-90-R Anxiety	High	(n=868) 2.9%	(n=364) 8.8%	(n=995) 9.2%	<0.001
SCL-90-R Depression	High	(n=868) 5.8%	(n=364) 12.9%	(n=995) 11.3%	<0.001
SCL-90-R Hostility	High	(n=868) 2.1%	(n=364) 7.1%	(n=995) 6.7%	<0.001
SCL-90-R Interpersonal Sensitivity	High	(n=868) 4.6%	(n=364) 11.8%	(n=995) 13.4%	<0.001
SCL-90-R Obsessive-Compulsive Behavior	High	(n=868) 5.7%	(n=364) 12.9%	(n=995) 12.0%	<0.001
SCL-90-R Paranoid Ideation	High	(n=868) 2.7%	(n=364) 7.1%	(n=995) 7.6%	<0.001
SCL-90-R Phobic Anxiety	High	(n=868) 2.7%	(n=364) 9.6%	(n=995) 12.5%	<0.001
SCL-90-R Psychoticism	High	(n=868) 5.0%	(n=364) 10.2%	(n=995) 12.5%	<0.001
SCL-90-R Somatization	High	(n=868) 4.3%	(n=364) 11.0%	(n=995) 12.0%	<0.001
SCL-90-R Global Severity Index	High	(n=868) 4.3%	(n=364) 10.7%	(n=995) 11.7%	<0.001
SCL-90-R Positive Symptom Total	High	(n=868) 5.5%	(n=364) 11.8%	(n=995) 13.7%	<0.001
SCL-90-R Positive Symptom Distress Index	High	(n=868) 4.4%	(n=364) 10.4%	(n=995) 9.5%	<0.001

Table H-1-1. (Continued)
Dependent Variable-Covariate Associations for the Psychological Assessment

Dependent Variable	Level	Current Alcohol Use (drinks/day)			p-Value
		0-1	>1-4	>4	
Psychoses		--	--	--	--
Alcohol Dependence		--	--	--	--
Drug Dependence		--	--	--	--
Anxiety		--	--	--	--
Other Neuroses		--	--	--	--
SCL-90-R Anxiety	High	(n=1,740) 6.5%	(n=400) 6.0%	(n=59) 13.6%	0.086
SCL-90-R Depression	High	(n=1,740) 9.2%	(n=400) 9.5%	(n=59) 11.9%	0.779
SCL-90-R Hostility	High	(n=1,740) 5.2%	(n=400) 3.5%	(n=59) 5.1%	0.352
SCL-90-R Interpersonal Sensitivity	High	(n=1,740) 9.8%	(n=400) 9.0%	(n=59) 8.5%	0.856
SCL-90-R Obsessive-Compulsive Behavior	High	(n=1,740) 9.5%	(n=400) 9.0%	(n=59) 15.3%	0.309
SCL-90-R Paranoid Ideation	High	(n=1,740) 5.2%	(n=400) 6.3%	(n=59) 11.9%	0.069
SCL-90-R Phobic Anxiety	High	(n=1,740) 8.3%	(n=400) 5.8%	(n=59) 17.0%	0.010
SCL-90-R Psychoticism	High	(n=1,740) 8.6%	(n=400) 9.5%	(n=59) 13.6%	0.383
SCL-90-R Somatization	High	(n=1,740) 8.8%	(n=400) 7.0%	(n=59) 13.6%	0.199
SCL-90-R Global Severity Index	High	(n=1,740) 8.6%	(n=400) 7.8%	(n=59) 13.6%	0.329
SCL-90-R Positive Symptom Total	High	(n=1,740) 9.9%	(n=400) 10.0%	(n=59) 13.6%	0.661
SCL-90-R Positive Symptom Distress Index	High	(n=1,740) 7.6%	(n=400) 5.3%	(n=59) 15.3%	0.017

--: Covariate not applicable for dependent variable.

Table H-1-1. (Continued)
Dependent Variable-Covariate Associations for the Psychological Assessment

Dependent Variable	Level	Lifetime Alcohol History (drink-years)			p-Value
		0	>0-40	>40	
Psychoses	Yes	(n=134) 3.0%	(n=1,488) 2.4%	(n=564) 4.3%	0.071
Alcohol Dependence		--	--	--	--
Drug Dependence	Yes	(n=134) 0.0%	(n=1,488) 0.2%	(n=564) 0.4%	0.688
Anxiety	Yes	(n=134) 17.9%	(n=1,484) 13.3%	(n=561) 15.9%	0.148
Other Neuroses	Yes	(n=133) 31.6%	(n=1,474) 34.3%	(n=554) 50.7%	<0.001
SCL-90-R Anxiety	High	(n=134) 8.2%	(n=1,487) 5.4%	(n=563) 9.2%	0.005
SCL-90-R Depression	High	(n=134) 9.7%	(n=1,487) 7.9%	(n=563) 12.8%	0.003
SCL-90-R Hostility	High	(n=134) 3.0%	(n=1,487) 4.2%	(n=563) 6.9%	0.020
SCL-90-R Interpersonal Sensitivity	High	(n=134) 12.7%	(n=1,487) 8.7%	(n=563) 11.2%	0.101
SCL-90-R Obsessive-Compulsive Behavior	High	(n=134) 6.7%	(n=1,487) 8.5%	(n=563) 13.1%	0.003
SCL-90-R Paranoid Ideation	High	(n=134) 3.7%	(n=1,487) 4.8%	(n=563) 7.8%	0.017
SCL-90-R Phobic Anxiety	High	(n=134) 11.9%	(n=1,487) 7.0%	(n=563) 10.1%	0.017
SCL-90-R Psychoticism	High	(n=134) 8.2%	(n=1,487) 7.7%	(n=563) 12.3%	0.005
SCL-90-R Somatization	High	(n=134) 9.0%	(n=1,487) 8.1%	(n=563) 9.8%	0.464
SCL-90-R Global Severity Index	High	(n=134) 8.2%	(n=1,487) 7.1%	(n=563) 12.3%	0.001
SCL-90-R Positive Symptom Total	High	(n=134) 11.9%	(n=1,487) 8.4%	(n=563) 13.9%	0.001
SCL-90-R Positive Symptom Distress Index	High	(n=134) 9.0%	(n=1,487) 7.3%	(n=563) 7.5%	0.773

--: Covariate not applicable for dependent variable.

Table H-1-1. (Continued)
Dependent Variable-Covariate Associations for the Psychological Assessment

Dependent Variable	Level	Education			Current Total Household Income		
		College	High School	p-Value	≤\$55,000	>\$55,000	p-Value
Psychoses	Yes	(n=1,160) 2.2%	(n=1,069) 3.6%	0.084	(n=1,077) 3.6%	(n=1,123) 2.2%	0.069
Alcohol Dependence	Yes	(n=1,160) 5.5%	(n=1,068) 8.5%	0.007	(n=1,076) 9.2%	(n=1,123) 4.8%	<0.001
Drug Dependence	Yes	(n=1,160) 0.2%	(n=1,069) 0.3%	0.927	(n=1,077) 0.4%	(n=1,123) 0.1%	0.346
Anxiety	Yes	(n=1,157) 10.8%	(n=1,064) 18.3%	<0.001	(n=1,072) 19.0%	(n=1,120) 10.0%	<0.001
Other Neuroses	Yes	(n=1,154) 33.1%	(n=1,050) 43.9%	<0.001	(n=1,063) 44.8%	(n=1,113) 31.9%	<0.001
SCL-90-R Anxiety	High	(n=1,160) 4.3%	(n=1,067) 9.2%	<0.001	(n=1,075) 9.7%	(n=1,123) 3.7%	<0.001
SCL-90-R Depression	High	(n=1,160) 6.4%	(n=1,067) 12.7%	<0.001	(n=1,075) 12.4%	(n=1,123) 6.4%	<0.001
SCL-90-R Hostility	High	(n=1,160) 3.0%	(n=1,067) 7.1%	<0.001	(n=1,075) 6.7%	(n=1,123) 3.5%	0.001
SCL-90-R Interpersonal Sensitivity	High	(n=1,160) 6.2%	(n=1,067) 13.5%	<0.001	(n=1,075) 13.4%	(n=1,123) 6.0%	<0.001
SCL-90-R Obsessive-Compulsive Behavior	High	(n=1,160) 6.6%	(n=1,067) 13.0%	<0.001	(n=1,075) 12.9%	(n=1,123) 6.4%	<0.001
SCL-90-R Paranoid Ideation	High	(n=1,160) 3.9%	(n=1,067) 7.5%	<0.001	(n=1,075) 8.2%	(n=1,123) 3.2%	<0.001
SCL-90-R Phobic Anxiety	High	(n=1,160) 4.1%	(n=1,067) 12.6%	<0.001	(n=1,075) 12.1%	(n=1,123) 4.4%	<0.001
SCL-90-R Psychoticism	High	(n=1,160) 6.3%	(n=1,067) 12.3%	<0.001	(n=1,075) 12.9%	(n=1,123) 5.4%	<0.001
SCL-90-R Somatization	High	(n=1,160) 5.5%	(n=1,067) 12.4%	<0.001	(n=1,075) 12.5%	(n=1,123) 5.2%	<0.001
SCL-90-R Global Severity Index	High	(n=1,160) 5.2%	(n=1,067) 12.4%	<0.001	(n=1,075) 12.1%	(n=1,123) 5.3%	<0.001
SCL-90-R Positive Symptom Total	High	(n=1,160) 6.8%	(n=1,067) 13.9%	<0.001	(n=1,075) 14.2%	(n=1,123) 6.3%	<0.001
SCL-90-R Positive Symptom Distress Index	High	(n=1,160) 6.0%	(n=1,067) 9.4%	0.004	(n=1,075) 9.9%	(n=1,123) 5.5%	<0.001

Table H-1-1. (Continued)
Dependent Variable-Covariate Associations for the Psychological Assessment

Dependent Variable	Level	Current Employment			Current Marital Status		
		Yes	No	p-Value	Married	Not Married	p-Value
Psychoses	Yes	(n=1,741) 2.8%	(n=486) 3.1%	0.870	(n=1,909) 2.2%	(n=318) 7.2%	<0.001
Alcohol Dependence	Yes	(n=1,740) 6.6%	(n=486) 8.4%	0.179	(n=1,909) 5.4%	(n=317) 16.4%	<0.001
Drug Dependence	Yes	(n=1,741) 0.3%	(n=486) 0.0%	0.522	(n=1,909) 0.1%	(n=318) 0.9%	0.022
Anxiety	Yes	(n=1,733) 14.0%	(n=486) 15.8%	0.349	(n=1,904) 13.4%	(n=315) 20.6%	0.001
Other Neuroses	Yes	(n=1,723) 37.1%	(n=479) 42.4%	0.040	(n=1,892) 35.6%	(n=310) 54.2%	<0.001
SCL-90-R Anxiety	High	(n=1,741) 5.9%	(n=484) 9.3%	0.010	(n=1,908) 5.9%	(n=317) 10.7%	0.002
SCL-90-R Depression	High	(n=1,741) 8.2%	(n=484) 13.4%	0.001	(n=1,908) 8.0%	(n=317) 17.4%	<0.001
SCL-90-R Hostility	High	(n=1,741) 4.7%	(n=484) 6.2%	0.206	(n=1,908) 4.7%	(n=317) 6.6%	0.192
SCL-90-R Interpersonal Sensitivity	High	(n=1,741) 9.3%	(n=484) 11.2%	0.242	(n=1,908) 8.8%	(n=317) 15.1%	0.001
SCL-90-R Obsessive-Compulsive Behavior	High	(n=1,741) 8.6%	(n=484) 13.2%	0.003	(n=1,908) 9.1%	(n=317) 12.6%	0.064
SCL-90-R Paranoid Ideation	High	(n=1,741) 5.3%	(n=484) 6.6%	0.336	(n=1,908) 5.0%	(n=317) 9.2%	0.005
SCL-90-R Phobic Anxiety	High	(n=1,741) 7.0%	(n=484) 12.2%	<0.001	(n=1,908) 7.5%	(n=317) 12.0%	0.009
SCL-90-R Psychoticism	High	(n=1,741) 8.0%	(n=484) 13.0%	0.001	(n=1,908) 8.4%	(n=317) 13.6%	0.004
SCL-90-R Somatization	High	(n=1,741) 7.6%	(n=484) 12.8%	0.001	(n=1,908) 7.9%	(n=317) 14.2%	<0.001
SCL-90-R Global Severity Index	High	(n=1,741) 7.7%	(n=484) 11.8%	0.006	(n=1,908) 7.4%	(n=317) 15.5%	<0.001
SCL-90-R Positive Symptom Total	High	(n=1,741) 9.2%	(n=484) 13.6%	0.005	(n=1,908) 9.0%	(n=317) 17.4%	<0.001
SCL-90-R Positive Symptom Distress Index	High	(n=1,741) 7.1%	(n=484) 9.5%	0.099	(n=1,908) 7.2%	(n=317) 10.4%	0.059

Table H-1-1. (Continued)
Dependent Variable-Covariate Associations for the Psychological Assessment

Dependent Variable	Level	Current Parental Status			Combat Service (days)		
		Child <18 Years Old	No Child <18 Years Old	p-Value	<360	≥360	p-Value
Psychoses	Yes	(n=585) 2.9%	(n=1,644) 2.9%	0.999	(n=1,115) 3.2%	(n=1,114) 2.5%	0.377
Alcohol Dependence	Yes	(n=585) 5.3%	(n=1,643) 7.6%	0.082	(n=1,114) 6.6%	(n=1,114) 7.3%	0.617
Drug Dependence	Yes	(n=585) 0.5%	(n=1,644) 0.1%	0.227	(n=1,115) 0.4%	(n=1,114) 0.1%	0.371
Anxiety	Yes	(n=584) 15.2%	(n=1,637) 14.1%	0.550	(n=1,111) 15.2%	(n=1,110) 13.6%	0.308
Other Neuroses	Yes	(n=580) 39.8%	(n=1,624) 37.7%	0.389	(n=1,104) 37.4%	(n=1,100) 39.1%	0.442
SCL-90-R Anxiety	High	(n=585) 6.3%	(n=1,642) 6.8%	0.790	(n=1,114) 6.2%	(n=1,113) 7.1%	0.441
SCL-90-R Depression	High	(n=585) 8.4%	(n=1,642) 9.7%	0.372	(n=1,114) 9.5%	(n=1,113) 9.3%	0.890
SCL-90-R Hostility	High	(n=585) 5.1%	(n=1,642) 4.9%	0.940	(n=1,114) 4.4%	(n=1,113) 5.6%	0.241
SCL-90-R Interpersonal Sensitivity	High	(n=585) 11.1%	(n=1,642) 9.2%	0.207	(n=1,114) 8.8%	(n=1,113) 10.6%	0.172
SCL-90-R Obsessive-Compulsive Behavior	High	(n=585) 9.1%	(n=1,642) 9.9%	0.627	(n=1,114) 8.8%	(n=1,113) 10.5%	0.194
SCL-90-R Paranoid Ideation	High	(n=585) 6.0%	(n=1,642) 5.5%	0.728	(n=1,114) 4.9%	(n=1,113) 6.3%	0.196
SCL-90-R Phobic Anxiety	High	(n=585) 7.0%	(n=1,642) 8.6%	0.267	(n=1,114) 8.1%	(n=1,113) 8.3%	0.933
SCL-90-R Psychoticism	High	(n=585) 8.2%	(n=1,642) 9.5%	0.396	(n=1,114) 9.3%	(n=1,113) 9.0%	0.831
SCL-90-R Somatization	High	(n=585) 8.6%	(n=1,642) 8.9%	0.867	(n=1,114) 8.8%	(n=1,113) 8.8%	0.999
SCL-90-R Global Severity Index	High	(n=585) 8.6%	(n=1,642) 8.7%	0.999	(n=1,114) 7.9%	(n=1,113) 9.3%	0.255
SCL-90-R Positive Symptom Total	High	(n=585) 10.4%	(n=1,642) 10.1%	0.890	(n=1,114) 9.7%	(n=1,113) 10.7%	0.479
SCL-90-R Positive Symptom Distress Index	High	(n=585) 5.8%	(n=1,642) 8.3%	0.066	(n=1,114) 7.8%	(n=1,113) 7.5%	0.816

APPENDIX H-2.

Interaction Tables for the Psychological Assessment

This appendix contains exposure analyses results of interactions between covariates and group or dioxin. Results are presented for separate strata of the covariate and include sample sizes, percent abnormal, relative risks, confidence intervals, and p-values. Chapter 7, Statistical Methods, provides further details on the analytical approaches used in the interaction analyses. The covariate involved in the interaction and a reference to the analysis table in Chapter 12 are given in the heading of each subtable. A summary of the interactions described in this appendix follows.

Appendix H-2 Table	Chapter 12 Table	Dependent Variable	Model	Covariate
H-2-1	12-4	Alcohol Dependence	1	Current Marital Status
H-2-2	12-6	Anxiety	2	Occupation
H-2-3	12-7	Other Neuroses	1 3 4 5 6	Education, Current Total Household Income Lifetime Alcohol History, Education, Current Total Household Income, Combat Service Lifetime Alcohol History Lifetime Alcohol History Lifetime Alcohol History
H-2-4	12-8	SCL-90-R Anxiety	2 4 5 6	Occupation, Current Alcohol Use Current Alcohol Use Current Alcohol Use Current Alcohol Use
H-2-5	12-9	SCL-90-R Depression	2 4 5 6	Lifetime Alcohol History Current Total Household Income Race, Current Total Household Income Race, Current Total Household Income
H-2-6	12-10	SCL-90-R Hostility	1	Current Alcohol Use, Education
H-2-7	12-11	SCL-90-R Interpersonal Sensitivity	2	Occupation, Lifetime Alcohol History
H-2-8	12-12	SCL-90-R Obsessive-Compulsive Behavior	2 4 5 6	Occupation, Current Total Household Income Current Alcohol Use, Current Total Household Income Current Alcohol Use, Current Total Household Income Current Alcohol Use, Current Total Household Income

Appendix H-2 Table	Chapter 12 Table	Dependent Variable	Model	Covariate
H-2-9	12-13	SCL-90-R Paranoid Ideation	1 3 4 5 6	Race Current Marital Status Education, Current Marital Status, Combat Service Education, Current Marital Status, Combat Service Education, Current Marital Status, Combat Service
H-2-10	12-15	SCL-90-R Psychoticism	3 4	Current Alcohol Use Current Alcohol Use
H-2-11	12-16	SCL-90-R Somatization	4 5 6	Current Alcohol Use, Education Current Alcohol Use Current Alcohol Use, Education
H-2-12	12-17	SCL-90-R Global Severity Index	2 4 5 6	Current Alcohol Use Current Alcohol Use Current Alcohol Use, Current Total Household Income Current Alcohol Use, Current Total Household Income
H-2-13	12-18	SCL-90-R Positive Symptom Total	2	Occupation, Current Total Household Income

Table H-2-1.
Interaction Table for Alcohol Dependence

a) MODEL 1: RANCH HANDS VS. COMPARISONS — ADJUSTED (Group-by-Current Marital Status: Table 12-4)						
Stratum	Occupational Category	Group	n	Percent Yes	Adj. Relative Risk (95% C.I.)	p-Value
<i>Married</i>	<i>All</i>	<i>Ranch Hand</i>	<i>813</i>	<i>6.6</i>	<i>1.50 (1.00,2.23)</i>	<i>0.049</i>
		<i>Comparison</i>	<i>1,077</i>	<i>4.6</i>		
<i>Not Married</i>	<i>All</i>	<i>Ranch Hand</i>	<i>125</i>	<i>12.8</i>	<i>0.64 (0.33,1.22)</i>	<i>0.176</i>
		<i>Comparison</i>	<i>184</i>	<i>18.5</i>		
Married	Officer	Ranch Hand	323	4.0	1.13 (0.59,2.18)	0.715
		Comparison	440	3.6		
	Enlisted Flyer	Ranch Hand	138	9.4	1.52 (0.71,3.27)	0.280
		Comparison	172	5.2		
	Enlisted Groundcrew	Ranch Hand	352	8.0	1.76 (1.03,3.00)	0.039
		Comparison	465	5.2		
Not Married	Officer	Ranch Hand	39	10.3	0.47 (0.20,1.11)	0.085
		Comparison	53	18.9		
	Enlisted Flyer	Ranch Hand	23	13.0	0.63 (0.25,1.60)	0.329
		Comparison	28	25.0		
	Enlisted Groundcrew	Ranch Hand	63	14.3	0.72 (0.36,1.47)	0.373
		Comparison	103	16.5		

**Table H-2-2.
Interaction Table for Anxiety**

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Occupation: Table 12-6)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log_e (Initial Dioxin)	
Stratum	Initial Dioxin	n	Percent Yes	Adjusted Relative Risk (95% C.I.)^a	p-Value
Officer	Low	76	7.9	0.06 (0.00,0.89)	0.041
	Medium	34	0.0		
	High	1	0.0		
Enlisted Flyer	Low	36	11.1	0.92 (0.58,1.48)	0.746
	Medium	43	25.6		
	High	31	16.1		
Enlisted Groundcrew	Low	61	18.0	0.99 (0.75,1.30)	0.926
	Medium	96	22.9		
	High	138	18.8		

^a Relative risk for a twofold increase in dioxin.

Note: Low = 39-98 ppt; Medium = >98-232 ppt; High = >232 ppt.

Table H-2-3.
Interaction Table for Other Neuroses

a) MODEL 1: RANCH HANDS VS. COMPARISONS — ADJUSTED (Group-by-Education: Table 12-7)						
Stratum	Occupational Category	Group	n	Percent Yes	Adj. Relative Risk (95% C.I.)	p-Value
<i>High School</i>	<i>All</i>	<i>Ranch Hand</i>	<i>439</i>	<i>51.7</i>	<i>1.78 (1.37,2.31)</i>	<i><0.001</i>
		<i>Comparison</i>	<i>576</i>	<i>38.2</i>		
<i>College</i>	<i>All</i>	<i>Ranch Hand</i>	<i>464</i>	<i>30.2</i>	<i>0.83 (0.64,1.08)</i>	<i>0.170</i>
		<i>Comparison</i>	<i>658</i>	<i>35.3</i>		
High School	Officer	Ranch Hand	41	41.5	2.14 (1.30,3.53)	0.003
		Comparison	56	32.1		
	Enlisted Flyer	Ranch Hand	114	53.5	1.64 (1.04,2.58)	0.034
		Comparison	142	42.3		
	Enlisted Groundcrew	Ranch Hand	284	52.5	1.80 (1.33,2.43)	<0.001
		Comparison	378	37.6		
College	Officer	Ranch Hand	314	26.8	0.90 (0.65,1.23)	0.498
		Comparison	428	28.7		
	Enlisted Flyer	Ranch Hand	39	38.5	0.69 (0.40,1.19)	0.179
		Comparison	54	46.3		
	Enlisted Groundcrew	Ranch Hand	111	36.9	0.75 (0.50,1.14)	0.179
		Comparison	176	47.7		

Table H-2-3. (Continued)
Interaction Table for Other Neuroses

b) MODEL 1: RANCH HANDS VS. COMPARISONS — ADJUSTED (Group-by-Current Total Household Income: Table 12-7)						
Stratum	Occupational Category	Group	n	Percent Yes	Adj. Relative Risk (95% C.I.)	p-Value
$\leq \$55,000$	<i>All</i>	<i>Ranch Hand Comparison</i>	418 618	47.1 43.9	1.14 (0.88,1.47)	0.336
$> \$55,000$	<i>All</i>	<i>Ranch Hand Comparison</i>	485 616	35.1 29.4	1.31 (1.01,1.69)	0.044
$\leq \$55,000$	Officer	Ranch Hand Comparison	75 117	34.7 32.5	0.77 (0.50,1.19)	0.236
	Enlisted Flyer	Ranch Hand Comparison	91 123	51.7 48.8	1.16 (0.73,1.85)	0.523
	Enlisted Groundcrew	Ranch Hand Comparison	252 378	49.2 45.8	1.25 (0.93,1.70)	0.142
$> \$55,000$	Officer	Ranch Hand Comparison	280 367	26.8 28.1	1.06 (0.76,1.46)	0.743
	Enlisted Flyer	Ranch Hand Comparison	62 73	46.8 34.3	1.60 (0.97,2.63)	0.067
	Enlisted Groundcrew	Ranch Hand Comparison	143 176	46.2 30.1	1.72 (1.18,2.51)	0.005

Table H-2-3. (Continued)
Interaction Table for Other Neuroses

c) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Lifetime Alcohol History: Table 12-7)					
Stratum	Dioxin Category	n	Percent Yes	Adjusted Relative Risk (95% C.I.)^a	p-Value
0 Drink-years	Comparison	53	28.3		
	Background RH	19	31.6	1.14 (0.35,3.70)	0.822
	Low RH	14	28.6	0.92 (0.24,3.49)	0.899
	High RH	24	41.7	1.34 (0.47,3.78)	0.585
	Low plus High RH	38	36.8	1.18 (0.47,2.97)	0.723
>0-40 Drink-years	Comparison	696	33.9		
	Background RH	251	30.7	1.05 (0.74,1.48)	0.796
	Low RH	165	40.6	1.28 (0.88,1.86)	0.205
	High RH	161	42.9	1.12 (0.75,1.65)	0.583
	Low plus High RH	326	41.7	1.20 (0.89,1.63)	0.238
>40 Drink-years	Comparison	273	50.6		
	Background RH	82	51.2	1.22 (0.72,2.06)	0.458
	Low RH	68	54.4	1.26 (0.72,2.20)	0.426
	High RH	63	58.7	1.00 (0.55,1.80)	0.987
	Low plus High RH	131	56.5	1.13 (0.72,1.77)	0.596

d) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Education: Table 12-7)					
Stratum	Dioxin Category	n	Percent Yes	Adjusted Relative Risk (95% C.I.)^a	p-Value
High School	Comparison	474	40.5		
	Background RH	115	53.9	1.93 (1.23,3.02)	0.004
	Low RH	122	52.5	1.69 (1.09,2.63)	0.018
	High RH	171	52.1	1.48 (0.99,2.20)	0.054
	Low plus High RH	293	52.2	1.57 (1.12,2.21)	0.009
College	Comparison	548	36.0		
	Background RH	237	26.6	0.75 (0.52,1.08)	0.124
	Low RH	125	35.2	0.98 (0.63,1.52)	0.928
	High RH	77	35.1	0.70 (0.40,1.20)	0.193
	Low plus High RH	202	35.2	0.86 (0.60,1.25)	0.441

Table H-2-3. (Continued)
Interaction Table for Other Neuroses

e) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Current Total Household Income: Table 12-7)					
Stratum	Dioxin Category	n	Percent Yes	Adjusted Relative Risk (95% C.I.)^a	p-Value
≤\$55,000	Comparison	501	45.3		
	Background RH	129	45.7	1.09 (0.71,1.66)	0.707
	Low RH	103	54.4	1.40 (0.88,2.23)	0.153
	High RH	158	43.7	0.80 (0.53,1.20)	0.278
	Low plus High RH	261	47.9	1.00 (0.71,1.41)	0.998
>\$55,000	Comparison	521	31.1		
	Background RH	223	29.6	1.07 (0.74,1.56)	0.705
	Low RH	144	36.1	1.19 (0.79,1.81)	0.401
	High RH	90	52.2	1.84 (1.12,3.02)	0.016
	Low plus High RH	234	42.3	1.42 (1.00,2.02)	0.052

f) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Combat Service: Table 12-7)					
Stratum	Dioxin Category	n	Percent Yes	Adjusted Relative Risk (95% C.I.)^a	p-Value
<360 Days	Comparison	789	37.9		
	Background RH	64	42.2	1.22 (0.71,2.12)	0.472
	Low RH	26	26.9	0.43 (0.17,1.10)	0.077
	High RH	26	57.7	1.80 (0.79,4.10)	0.162
	Low plus High RH	52	42.3	0.93 (0.51,1.69)	0.807
≥360 Days	Comparison	233	38.6		
	Background RH	288	34.0	0.98 (0.67,1.44)	0.931
	Low RH	221	45.7	1.31 (0.89,1.95)	0.172
	High RH	222	45.5	0.94 (0.62,1.41)	0.761
	Low plus High RH	443	45.6	1.12 (0.79,1.58)	0.527

Table H-2-3. (Continued)
Interaction Table for Other Neuroses

g) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Lifetime Alcohol History: Table 12-7)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent Yes	Adjusted Relative Risk (95% C.I.) ^b	p-Value
0 Drink-years	Low	17	23.5	1.09 (0.77,1.54)	0.613
	Medium	18	27.8		
	High	23	47.8		
>0-40 Drink-years	Low	202	29.7	1.00 (0.87,1.15)	0.964
	Medium	194	38.7		
	High	189	43.4		
>40 Drink-years	Low	66	47.0	0.91 (0.75,1.10)	0.331
	Medium	77	59.7		
	High	72	55.6		

h) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Lifetime Alcohol History: Table 12-7)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent Yes	Adjusted Relative Risk (95% C.I.) ^b	p-Value
0 Drink-years	Low	18	33.3	1.12 (0.84,1.51)	0.444
	Medium	14	21.4		
	High	26	42.3		
>0-40 Drink-years	Low	204	28.9	1.03 (0.92,1.16)	0.566
	Medium	199	38.2		
	High	182	45.1		
>40 Drink-years	Low	67	46.3	0.93 (0.79,1.09)	0.361
	Medium	74	59.5		
	High	74	56.8		

Table H-2-3. (Continued)
Interaction Table for Other Neuroses

i) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Lifetime Alcohol History: Table 12-7)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent Yes	Adjusted Relative Risk (95% C.I.) ^b	p-Value
0 Drink-years	Low	18	33.3	1.03 (0.77,1.38)	0.855
	Medium	14	21.4		
	High	26	42.3		
>0-40 Drink-years	Low	203	28.6	0.97 (0.86,1.10)	0.666
	Medium	199	38.2		
	High	182	45.1		
>40 Drink-years	Low	67	46.3	0.86 (0.73,1.02)	0.094
	Medium	74	59.5		
	High	74	56.8		

^a Relative risk and confidence interval relative to Comparisons.

^b Relative risk for a twofold increase in current dioxin.

Note: Model 3: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Model 4: Low = ≤ 8.1 ppt; Medium = > 8.1-20.5 ppt; High = >20.5 ppt.

Models 5 and 6: Low = ≤ 46 ppq; Medium = > 46-128 ppq; High = > 128 ppq.

Table H-2-4.
Interaction Table for SCL-90-R Anxiety

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Occupation: Table 12-8)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log₂ (Initial Dioxin)	
Stratum	Initial Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.)^a	p-Value
Officer	Low	75	5.3	0.05 (0.00,1.40)	0.076
	Medium	34	0.0		
	High	1	0.0		
Enlisted Flyer	Low	34	5.9	1.58 (0.96,2.60)	0.074
	Medium	43	14.0		
	High	29	13.8		
Enlisted Groundcrew	Low	58	10.3	1.00 (0.91,1.10)	0.999
	Medium	90	10.0		
	High	136	11.0		

b) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Current Alcohol Use: Table 12-8)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log₂ (Initial Dioxin)	
Stratum	Initial Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.)^a	p-Value
0-1 Drinks/Day	Low	126	6.4	1.19 (0.90,1.57)	0.222
	Medium	134	9.7		
	High	136	13.2		
>1 Drink/Day	Low	41	9.8	0.43 (0.18,1.02)	0.056
	Medium	33	6.1		
	High	30	3.3		

Table H-2-4. (Continued)
Interaction Table for SCL-90-R Anxiety

c) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Current Alcohol Use: Table 12-8)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.) ^b	p-Value
0-1 Drinks/Day	Low	221	4.1	1.24 (1.03,1.50)	0.027
	Medium	214	6.5		
	High	238	12.2		
> 1-4 Drinks/Day	Low	57	7.0	0.81 (0.53,1.25)	0.350
	Medium	70	5.7		
	High	44	6.8		
> 4 Drinks/Day	Low	6	16.7	0.58 (0.22,1.58)	0.289
	Medium	3	33.3		
	High	6	0.0		

d) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Current Alcohol Use: Table 12-8)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.) ^b	p-Value
0-1 Drinks/Day	Low	225	4.0	1.24 (1.05,1.48)	0.013
	Medium	216	6.9		
	High	232	12.1		
> 1-4 Drinks/Day	Low	58	6.9	0.84 (0.58,1.22)	0.366
	Medium	67	7.5		
	High	46	4.4		
> 4 Drinks/Day	Low	5	0.0	0.80 (0.40,1.63)	0.544
	Medium	4	50.0		
	High	6	0.0		

Table H-2-4. (Continued)
Interaction Table for SCL-90-R Anxiety

e) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Current Alcohol Use: Table 12-8)					
Current Dioxin Category Summary Statistics				Analysis Results for Log _e (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.) ^b	p-Value
0-1 Drinks/Day	Low	224	4.0	1.19 (1.00,1.43)	0.056
	Medium	216	6.9		
	High	232	12.1		
>1-4 Drinks/Day	Low	58	6.9	0.81 (0.56,1.18)	0.276
	Medium	67	7.5		
	High	46	4.4		
>4 Drinks/Day	Low	5	0.0	0.79 (0.39,1.59)	0.511
	Medium	4	50.0		
	High	6	0.0		

^a Relative risk for a twofold increase in initial dioxin.

^b Relative risk for a twofold increase in current dioxin.

Note: Model 2: Low = 39-98 ppt; Medium = > 98-232 ppt; High = > 232 ppt.

Model 4: Low = ≤ 8.1 ppt; Medium = > 8.1-20.5 ppt; High = > 20.5 ppt.

Models 5 and 6: Low = ≤ 46 ppq; Medium = > 46-128 ppq; High = > 128 ppq.

Table H-2-5.
Interaction Table for SCL-90-R Depression

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Lifetime Alcohol History: Table 12-9)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log₂ (Initial Dioxin)	
Stratum	Initial Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.)^a	p-Value
0 Drink-years	Low	10	0.0	1.42 (0.67,3.00)	0.359
	Medium	12	16.7		
	High	17	17.7		
> 0-40 Drink-years	Low	119	3.7	1.64 (1.20,2.23)	0.002
	Medium	108	5.6		
	High	106	13.2		
> 40 Drink-years	Low	41	22.0	0.74 (0.50,1.12)	0.153
	Medium	48	16.7		
	High	43	14.0		

b) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Current Total Household Income: Table 12-9)					
Current Dioxin Category Summary Statistics				Analysis Results for Log₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.)^b	p-Value
≤\$55,000	Low	107	19.6	0.84 (0.69,1.01)	0.068
	Medium	113	12.4		
	High	177	13.0		
> \$55,000	Low	177	2.8	1.60 (1.21,2.11)	0.001
	Medium	174	5.8		
	High	111	11.7		

c) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Race: Table 12-9)					
Current Dioxin Category Summary Statistics				Analysis Results for Log₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.)^b	p-Value
Non-Black	Low	275	10.2	0.99 (0.87,1.14)	0.937
	Medium	265	7.2		
	High	269	13.0		
Black	Low	13	0.0	2.82 (1.00,7.90)	0.049
	Medium	22	9.1		
	High	15	13.3		

Table H-2-5. (Continued)
Interaction Table for SCL-90-R Depression

d) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Current Total Household Income: Table 12-9)					
Current Dioxin Category Summary Statistics				Analysis Results for Log₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.)^b	p-Value
≤\$55,000	Low	106	20.8	0.86 (0.73,1.01)	0.064
	Medium	121	11.6		
	High	170	12.9		
>\$55,000	Low	182	3.3	1.61 (1.26,2.07)	<0.001
	Medium	166	4.2		
	High	114	13.2		

e) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Race: Table 12-9)					
Current Dioxin Category Summary Statistics				Analysis Results for Log₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.)^b	p-Value
Non-Black	Low	274	10.2	0.93 (0.80,1.07)	0.310
	Medium	265	7.2		
	High	269	13.0		
Black	Low	13	0.0	2.67 (0.95,7.46)	0.062
	Medium	22	9.1		
	High	15	13.3		

f) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Current Total Household Income: Table 12-9)					
Current Dioxin Category Summary Statistics				Analysis Results for Log₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.)^b	p-Value
≤\$55,000	Low	105	21.0	0.80 (0.67,0.95)	0.012
	Medium	121	11.6		
	High	170	12.9		
>\$55,000	Low	182	3.3	1.49 (1.15,1.94)	0.003
	Medium	166	4.2		
	High	114	13.2		

^a Relative risk for a twofold increase in initial dioxin.

^b Relative risk for a twofold increase in current dioxin.

Note: Model 2: Low = 39-98 ppt; Medium = > 98-232 ppt; High = > 232 ppt.

Model 4: Low = ≤ 8.1 ppt; Medium = > 8.1-20.5 ppt; High = >20.5 ppt.

Models 5 and 6: Low = ≤ 46 ppq; Medium = > 46-128 ppq; High = > 128 ppq.

Table H-2-6.
Interaction Table for SCL-90-R Hostility

a) MODEL 1: RANCH HANDS VS. COMPARISONS — ADJUSTED (Group-by-Current Alcohol Use: Table 12-10)						
Stratum	Occupational Category	Group	n	Percent High	Adj. Relative Risk (95% C.I.)	p-Value
<i>0-1 Drinks/Day</i>	<i>All</i>	<i>Ranch Hand</i>	<i>717</i>	<i>6.1</i>	<i>1.30 (0.84,2.01)</i>	<i>0.231</i>
		<i>Comparison</i>	<i>990</i>	<i>4.7</i>		
<i>>1 Drink/Day</i>	<i>All</i>	<i>Ranch Hand</i>	<i>198</i>	<i>5.1</i>	<i>2.84 (0.94,8.57)</i>	<i>0.064</i>
		<i>Comparison</i>	<i>254</i>	<i>2.0</i>		
<i>0-1 Drinks/Day</i>	Officer	Ranch Hand	252	1.6	0.56 (0.19,1.66)	0.295
		Comparison	364	2.5		
	Enlisted Flyer	Ranch Hand	124	11.3	1.85 (0.79,4.31)	0.154
		Comparison	155	5.2		
	Enlisted Groundcrew	Ranch Hand	341	7.6	1.39 (0.81,2.38)	0.230
		Comparison	471	6.2		
<i>>1 Drink/Day</i>	Officer	Ranch Hand	106	0.9	1.28 (0.30,5.45)	0.737
		Comparison	122	1.6		
	Enlisted Flyer	Ranch Hand	30	6.7	4.25 (1.14,15.82)	0.031
		Comparison	44	4.6		
	Enlisted Groundcrew	Ranch Hand	62	11.3	3.20 (0.99,10.28)	0.051
		Comparison	88	1.1		

Table H-2-6. (Continued)
Interaction Table for SCL-90-R Hostility

b) MODEL 1: RANCH HANDS VS. COMPARISONS — ADJUSTED (Group-by-Education: Table 12-10)						
Stratum	Occupational Category	Group	n	Percent High	Adj. Relative Risk (95% C.I.)	p-Value
<i>High School</i>	<i>All</i>	<i>Ranch Hand</i>	<i>447</i>	<i>9.6</i>	<i>1.89 (1.16,3.09)</i>	<i>0.011</i>
		<i>Comparison</i>	<i>584</i>	<i>5.1</i>		
<i>College</i>	<i>All</i>	<i>Ranch Hand</i>	<i>468</i>	<i>2.4</i>	<i>0.77 (0.36,1.63)</i>	<i>0.495</i>
		<i>Comparison</i>	<i>660</i>	<i>3.2</i>		
High School	Officer	Ranch Hand	41	0.0	--	--
		Comparison	57	3.5		
	Enlisted Flyer	Ranch Hand	115	10.4	2.34 (1.00,5.49)	0.051
		Comparison	144	4.9		
	Enlisted Groundcrew	Ranch Hand	291	10.7	1.79 (1.02,3.15)	0.044
		Comparison	383	5.5		
College	Officer	Ranch Hand	317	1.6	0.56 (0.19,1.67)	0.301
		Comparison	429	2.1		
	Enlisted Flyer	Ranch Hand	39	10.3	1.17 (0.36,3.77)	0.789
		Comparison	55	5.5		
	Enlisted Groundcrew	Ranch Hand	112	1.8	0.90 (0.35,2.32)	0.821
		Comparison	176	5.1		

--: Adjusted relative risk, confidence interval, and p-value not presented due to the sparse number of abnormalities.

Table H-2-7.
Interaction Table for SCL-90-R Interpersonal Sensitivity

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Occupation: Table 12-11)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log₂ (Initial Dioxin)	
Stratum	Initial Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.)^a	p-Value
Officer	Low	75	10.7	0.06 (0.01,0.61)	0.017
	Medium	34	0.0		
	High	1	0.0		
Enlisted Flyer	Low	34	5.9	1.45 (0.76,2.80)	0.261
	Medium	43	11.6		
	High	29	10.3		
Enlisted Groundcrew	Low	58	12.1	1.01 (0.78,1.31)	0.928
	Medium	90	12.2		
	High	136	15.4		

b) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Lifetime Alcohol History: Table 12-11)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log₂ (Initial Dioxin)	
Stratum	Initial Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.)^a	p-Value
0 Drink-years	Low	10	0.0	1.30 (0.62,2.72)	0.482
	Medium	12	16.7		
	High	17	17.7		
>0-40 Drink-years	Low	116	8.6	1.01 (0.75,1.37)	0.948
	Medium	107	8.4		
	High	106	11.3		
>40 Drink-years	Low	41	17.1	0.97 (0.67,1.42)	0.890
	Medium	48	10.4		
	High	43	20.9		

^a Relative risk for a twofold increase in initial dioxin.

Note: Low = 39-98 ppt; Medium = > 98-232 ppt; High = > 232 ppt.

Table H-2-8.
Interaction Table for SCL-90-R Obsessive-Compulsive Behavior

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Occupation: Table 12-12)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log _e (Initial Dioxin)	
Stratum	Initial Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.) ^a	p-Value
Officer	Low	75	9.3	0.12 (0.01,0.97)	0.047
	Medium	34	0.0		
	High	1	0.0		
Enlisted Flyer	Low	34	8.8	1.06 (0.57,1.99)	0.846
	Medium	43	11.6		
	High	29	6.9		
Enlisted Groundcrew	Low	58	13.8	1.11 (0.88,1.39)	0.369
	Medium	90	10.0		
	High	136	14.7		

b) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Current Total Household Income: Table 12-12)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log _e (Initial Dioxin)	
Stratum	Initial Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.) ^a	p-Value
≤\$55,000	Low	71	15.5	0.98 (0.74,1.30)	0.900
	Medium	83	8.4		
	High	110	13.6		
>\$55,000	Low	96	7.3	1.23 (0.83,1.82)	0.308
	Medium	84	8.3		
	High	56	12.5		

Table H-2-8. (Continued)
Interaction Table for SCL-90-R Obsessive-Compulsive Behavior

c) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Current Alcohol Use and Current Total Household Income: Table 12-12)					
Current Dioxin Category Summary Statistics				Analysis Results for Log _e (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.) ^b	p-Value
≤\$55,000, 0-1 Drinks/Day	Low	86	16.3	0.93 (0.76,1.14)	0.050
	Medium	92	15.2		
	High	142	13.4		
≤\$55,000, >1-4 Drinks/Day	Low	17	23.5	0.63 (0.40,1.00)	0.049
	Medium	20	5.0		
	High	29	10.3		
≤\$55,000, >4 Drinks/Day	Low	4	50.0	0.13 (0.01,1.19)	0.072
	Medium	1	100.0		
	High	6	0.0		
>\$55,000, 0-1 Drinks/Day	Low	135	5.2	1.30 (1.00,1.68)	0.050
	Medium	122	7.4		
	High	96	13.5		
>\$55,000, >1-4 Drinks/Day	Low	40	5.0	0.88 (0.54,1.44)	0.616
	Medium	50	8.0		
	High	15	0.0		
>\$55,000, >4 Drinks/Day	Low	2	50.0	0.19 (0.02,1.67)	0.133
	Medium	2	0.0		
	High	0	0.0		

Table H-2-8. (Continued)
Interaction Table for SCL-90-R Obsessive-Compulsive Behavior

d) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Current Alcohol Use and Current Total Household Income: Table 12-12)					
Current Dioxin Category Summary Statistics				Analysis Results for Log _e (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.) ^b	p-Value
≤\$55,000, 0-1 Drinks/Day	Low	86	18.6	0.92 (0.78,1.09)	0.330
	Medium	97	12.4		
	High	137	13.9		
≤\$55,000, >1-4 Drinks/Day	Low	17	23.5	0.66 (0.44,0.97)	0.036
	Medium	22	9.1		
	High	27	7.4		
≤\$55,000, >4 Drinks/Day	Low	3	33.3	0.26 (0.07,1.00)	0.050
	Medium	2	100.0		
	High	6	0.0		
>\$55,000, 0-1 Drinks/Day	Low	139	5.0	1.32 (1.05,1.66)	0.016
	Medium	119	6.7		
	High	95	14.7		
>\$55,000, >1-4 Drinks/Day	Low	41	7.3	0.94 (0.62,1.43)	0.787
	Medium	45	4.4		
	High	19	5.3		
>\$55,000, >4 Drinks/Day	Low	2	50.0	0.37 (0.09,1.45)	0.154
	Medium	2	0.0		
	High	0	0.0		

Table H-2-8. (Continued)
Interaction Table for SCL-90-R Obsessive-Compulsive Behavior

e) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Current Alcohol Use and Current Total Household Income: Table 12-12)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.) ^b	p-Value
≤\$55,000, 0-1 Drinks/Day	Low	85	17.7	0.92 (0.76,1.10)	0.337
	Medium	97	12.4		
	High	137	13.9		
≤\$55,000, >1-4 Drinks/Day	Low	17	23.5	0.64 (0.43,1.08)	0.027
	Medium	22	9.1		
	High	27	7.4		
≤\$55,000, >4 Drinks/Day	Low	3	33.3	0.24 (0.05,1.08)	0.062
	Medium	2	100.0		
	High	6	0.0		
>\$55,000, 0-1 Drinks/Day	Low	139	5.0	1.26 (1.00,1.59)	0.054
	Medium	119	6.7		
	High	95	14.7		
>\$55,000, >1-4 Drinks/Day	Low	41	7.3	0.88 (0.58,1.33)	0.545
	Medium	45	4.4		
	High	19	5.3		
>\$55,000, >4 Drinks/Day	Low	2	50.0	0.33 (0.07,1.50)	0.151
	Medium	2	0.0		
	High	0	0.0		

^a Relative risk for a twofold increase in initial dioxin.

^b Relative risk for a twofold increase in current dioxin.

Note: Model 2: Low = 39-98 ppt; Medium = > 98-232 ppt; High = > 232 ppt.

Model 4: Low = ≤ 8.1 ppt; Medium = > 8.1-20.5 ppt; High = >20.5 ppt.

Models 5 and 6: Low = ≤ 46 ppq; Medium = > 46-128 ppq; High = > 128 ppq.

Table H-2-9.
Interaction Table for SCL-90-R Paranoid Ideation

a) MODEL 1: RANCH HANDS VS. COMPARISONS — ADJUSTED (Group-by-Race: Table 12-13)						
Stratum	Occupational Category	Group	n	Percent High	Adj. Relative Risk (95% C.I.)	p-Value
<i>Non-Black</i>	<i>All</i>	<i>Ranch Hand Comparison</i>	<i>861 1,170</i>	<i>7.0 3.9</i>	<i>1.88 (1.25,2.81)</i>	<i>0.002</i>
<i>Black</i>	<i>All</i>	<i>Ranch Hand Comparison</i>	<i>54 74</i>	<i>7.4 12.2</i>	<i>0.50 (0.14,1.79)</i>	<i>0.288</i>
Non-Black	Officer	Ranch Hand Comparison	351 480	3.1 2.3	1.50 (0.64,3.52)	0.349
	Enlisted Flyer	Ranch Hand Comparison	145 184	10.3 3.8	2.56 (1.06,6.18)	0.037
	Enlisted Groundcrew	Ranch Hand Comparison	365 506	9.3 5.5	1.84 (1.10,3.09)	0.021
Black	Officer	Ranch Hand Comparison	7 6	0.0 0.0	--	--
	Enlisted Flyer	Ranch Hand Comparison	9 15	0.0 13.3	--	--
	Enlisted Groundcrew	Ranch Hand Comparison	38 53	10.5 13.2	0.48 (0.13,1.72)	0.257

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Current Marital Status: Table 12-13)						
Stratum	Dioxin Category	n	Percent High	Adjusted Relative Risk (95% C.I.)^a	p-Value	
Married	Comparison	894	3.9			
	Background RH	317	6.6	2.36 (1.31,4.27)	0.004	
	Low RH	216	4.6	1.17 (0.56,2.44)	0.668	
	High RH	213	5.6	1.06 (0.53,2.11)	0.878	
	Low plus High RH	429	5.1	1.10 (0.63,1.93)	0.729	
Not Married	Comparison	137	5.8			
	Background RH	42	4.8	1.08 (0.21,5.57)	0.925	
	Low RH	33	9.1	1.78 (0.42,7.47)	0.433	
	High RH	38	26.3	3.34 (1.16,9.58)	0.025	
	Low plus High RH	71	18.3	3.42 (1.30,8.97)	0.012	

Table H-2-9. (Continued)
Interaction Table for SCL-90-R Paranoid Ideation

c) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Education: Table 12-13)					
Current Dioxin Category Summary Statistics				Analysis Results for Log _e (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.) ^b	p-Value
High School	Low	86	7.0	1.02 (0.82,1.28)	0.831
	Medium	137	7.3		
	High	193	11.9		
College	Low	198	6.1	0.66 (0.44,0.98)	0.041
	Medium	150	2.7		
	High	95	3.2		

d) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Current Marital Status: Table 12-13)					
Current Dioxin Category Summary Statistics				Analysis Results for Log _e (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.) ^b	p-Value
Married	Low	249	6.8	0.81 (0.65,1.02)	0.074
	Medium	250	4.0		
	High	247	6.5		
Not Married	Low	35	2.9	1.32 (0.89,1.94)	0.165
	Medium	37	10.8		
	High	41	24.4		

e) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Combat Service: Table 12-13)					
Current Dioxin Category Summary Statistics				Analysis Results for Log _e (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.) ^b	p-Value
0-360 Days	Low	55	9.1	0.77 (0.42,1.40)	0.389
	Medium	33	3.0		
	High	29	3.5		
> 360 Days	Low	229	5.7	0.91 (0.74,1.12)	0.375
	Medium	254	5.1		
	High	259	9.7		

Table H-2-9. (Continued)
Interaction Table for SCL-90-R Paranoid Ideation

f) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Education: Table 12-13)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.) ^b	p-Value
High School	Low	93	6.5	1.08 (0.89;1.31)	0.448
	Medium	140	9.3		
	High	183	10.9		
College	Low	195	6.2	0.70 (0.52,0.95)	0.022
	Medium	147	2.7		
	High	101	3.0		

g) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Current Marital Status: Table 12-13)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.) ^b	p-Value
Married	Low	250	6.8	0.87 (0.72,1.04)	0.130
	Medium	250	4.8		
	High	246	5.7		
Not Married	Low	38	2.6	1.32 (0.93,1.87)	0.115
	Medium	37	13.5		
	High	38	23.7		

h) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Combat Service: Table 12-13)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.) ^b	p-Value
0-360 Days	Low	57	8.8	0.83 (0.51,1.34)	0.449
	Medium	28	3.6		
	High	32	3.1		
>360 Days	Low	231	5.6	0.96 (0.80,1.14)	0.606
	Medium	259	6.2		
	High	252	8.7		

Table H-2-9. (Continued)
Interaction Table for SCL-90-R Paranoid Ideation

i) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Education: Table 12-13)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.) ^b	p-Value
High School	Low	92	6.5	1.04 (0.84,1.28)	0.729
	Medium	140	9.3		
	High	183	10.9		
College	Low	195	6.2	0.69 (0.51,0.93)	0.016
	Medium	147	2.7		
	High	101	3.0		

j) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Current Marital Status: Table 12-13)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.) ^b	p-Value
Married	Low	249	6.8	0.83 (0.68,1.02)	0.072
	Medium	250	4.8		
	High	246	5.7		
Not Married	Low	38	2.6	1.27 (0.89,1.82)	0.190
	Medium	37	13.5		
	High	38	23.7		

k) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Combat Service: Table 12-13)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.) ^b	p-Value
0-360 Days	Low	57	8.8	0.80 (0.49,1.28)	0.348
	Medium	28	3.6		
	High	32	3.1		
>360 Days	Low	230	5.7	0.91 (0.75,1.10)	0.335
	Medium	259	6.2		
	High	252	8.7		

^a Relative risk and confidence interval relative to Comparisons.

^b Relative risk for a twofold increase in current dioxin.

--: Adjusted relative risk, confidence interval, an p-value not presented due to the sparse number of abnormalities.

Note: Model 3: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Model 4: Low = ≤ 8.1 ppt; Medium = > 8.1-20.5 ppt; High = >20.5 ppt.

Models 5 and 6: Low = ≤ 46 ppq; Medium = > 46-128 ppq; High = > 128 ppq.

Table H-2-10.
Interaction Table for SCL-90-R Psychoticism

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Current Alcohol Use: Table 12-15)					
Stratum	Dioxin Category	n	Percent High	Adjusted Relative Risk (95% C.I.) ^a	p-Value
0-1 Drinks/ Day	Comparison	818	8.1		
	Background RH	277	6.9	1.04 (0.60,1.81)	0.889
	Low RH	190	7.9	0.88 (0.48,1.60)	0.672
	High RH	206	11.7	1.21 (0.72,2.02)	0.468
	Low plus High RH	396	9.9	1.05 (0.69,1.62)	0.810
>1-4 Drinks/ Day	Comparison	179	7.8		
	Background RH	75	14.7	2.61 (1.08,6.30)	0.033
	Low RH	56	5.4	0.71 (0.19,2.61)	0.601
	High RH	40	10.0	0.77 (0.23,2.58)	0.674
	Low plus High RH	96	7.3	0.74 (0.28,1.94)	0.541
>4 Drinks/ Day	Comparison	34	8.8		
	Background RH	7	28.6	8.67 (1.05,71.5)	0.045
	Low RH	3	33.3	5.50 (0.29,103.9)	0.255
	High RH	5	0.0	--	--
	Low plus High RH	8	12.5	1.16 (0.09,14.61)	0.907

Table H-2-10. (Continued)
Interaction Table for SCL-90-R Psychoticism

b) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Current Alcohol Use: Table 12-15)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.) ^b	p-Value
0-1 Drinks/ Day	Low	221	6.3	1.03 (0.85,1.24)	0.777
	Medium	214	7.5		
	High	238	11.8		
>1-4 Drinks/Day	Low	57	12.3	0.77 (0.53,1.12)	0.174
	Medium	70	11.4		
	High	44	6.8		
>4 Drinks/Day	Low	6	33.3	0.52 (0.22,1.24)	0.141
	Medium	3	33.3		
	High	6	0.0		

^a Relative risk and confidence interval relative to Comparisons.

^b Relative risk for a twofold increase in current dioxin.

--: Adjusted relative risk, confidence interval, and p-value not presented due to the sparse number of abnormalities.

Note: Model 3: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Model 4: Low = ≤ 8.1 ppt; Medium = > 8.1-20.5 ppt; High = > 20.5 ppt.

Table H-2-11.
Interaction Table for SCL-90-R Somatization

a) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Current Alcohol Use: Table 12-16)					
Current Dioxin Category Summary Statistics				Analysis Results for Log₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.)^a	p-Value
0-1 Drinks/Day	Low	221	8.1	1.09 (0.92,1.29)	0.301
	Medium	214	8.4		
	High	238	14.7		
>1-4 Drinks/Day	Low	57	5.3	0.95 (0.64,1.40)	0.789
	Medium	70	8.6		
	High	44	6.8		
>4 Drinks/Day	Low	6	33.3	0.50 (0.21,1.23)	0.132
	Medium	3	33.3		
	High	6	0.0		

b) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Education: Table 12-16)					
Current Dioxin Category Summary Statistics				Analysis Results for Log₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.)^a	p-Value
High School	Low	86	18.6	0.95 (0.80,1.14)	0.589
	Medium	137	13.1		
	High	193	14.5		
College	Low	198	3.5	1.35 (1.02,1.79)	0.036
	Medium	150	4.7		
	High	95	10.5		

c) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Current Alcohol Use: Table 12-16)					
Current Dioxin Category Summary Statistics				Analysis Results for Log₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.)^a	p-Value
0-1 Drinks/Day	Low	225	8.0	1.11 (0.96,1.29)	0.152
	Medium	216	7.9		
	High	232	15.5		
>1-4 Drinks/Day	Low	58	5.2	0.99 (0.71,1.40)	0.976
	Medium	67	9.0		
	High	46	6.5		
>4 Drinks/Day	Low	5	20.0	0.68 (0.39,1.19)	0.174
	Medium	4	50.0		
	High	6	0.0		

Table H-2-11. (Continued)
Interaction Table for SCL-90-R Somatization

d) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Current Alcohol Use: Table 12-16)					
Current Dioxin Category Summary Statistics				Analysis Results for Log₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.)^a	p-Value
0-1 Drinks/Day	Low	224	8.0	1.04 (0.89,1.22)	0.648
	Medium	216	7.9		
	High	232	15.5		
>1-4 Drinks/Day	Low	58	5.2	0.93 (0.66,1.31)	0.677
	Medium	67	9.0		
	High	46	6.5		
>4 Drinks/Day	Low	5	20.0	0.66 (0.37,1.15)	0.144
	Medium	4	50.0		
	High	6	0.0		

e) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Education: Table 12-16)					
Current Dioxin Category Summary Statistics				Analysis Results for Log₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.)^a	p-Value
High School	Low	92	17.4	0.92 (0.78,1.09)	0.342
	Medium	140	12.1		
	High	183	15.9		
College	Low	195	3.1	1.25 (0.96,1.63)	0.097
	Medium	147	5.4		
	High	101	9.9		

^a Relative risk for a twofold increase in current dioxin.

Note: Model 4: Low = ≤ 8.1 ppt; Medium = > 8.1-20.5 ppt; High = > 20.5 ppt.

Models 5 and 6: Low = ≤ 46 ppq; Medium = > 46-128 ppq; High = > 128 ppq.

Table H-2-12.
Interaction Table for SCL-90-R Global Severity Index

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Current Alcohol Use: Table 12-17)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log₂ (Initial Dioxin)	
Stratum	Initial Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.)^a	p-Value
0-1 Drinks/Day	Low	129	8.5	1.32 (1.05,1.66)	0.019
	Medium	135	10.4		
	High	136	16.9		
>1-4 Drinks/Day	Low	39	7.7	0.56 (0.28,1.10)	0.091
	Medium	29	10.3		
	High	28	3.6		
>4 Drinks/Day	Low	2	50.0	0.08 (0.00,83.59)	0.480
	Medium	4	0.0		
	High	2	0.0		

b) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Current Alcohol Use: Table 12-17)					
Current Dioxin Category Summary Statistics				Analysis Results for Log₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.)^b	p-Value
0-1 Drinks/Day	Low	221	7.2	1.17 (0.99,1.39)	0.070
	Medium	214	7.9		
	High	238	15.1		
>1-4 Drinks/Day	Low	57	8.8	0.73 (0.48,1.10)	0.131
	Medium	70	7.1		
	High	44	6.8		
>4 Drinks/Day	Low	6	16.7	0.55 (0.20,1.51)	0.250
	Medium	3	33.0		
	High	6	0.0		

Table H-2-12. (Continued)
Interaction Table for SCL-90-R Global Severity Index

c) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Current Alcohol Use: Table 12-17)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.) ^b	p-Value
0-1 Drinks/ Day	Low	225	7.6	1.16 (1.00,1.35)	0.049
	Medium	216	7.4		
	High	232	15.5		
>1-4 Drinks/ Day	Low	58	8.6	0.77 (0.55,1.08)	0.133
	Medium	67	9.0		
	High	46	4.4		
>4 Drinks/Day	Low	5	0.0	0.78 (0.38,1.59)	0.494
	Medium	4	50.0		
	High	6	0.0		

d) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Current Total Household Income: Table 12-17)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.) ^b	p-Value
≤\$55,000	Low	106	15.1	0.96 (0.82,1.12)	0.596
	Medium	121	14.1		
	High	170	13.5		
>\$55,000	Low	182	3.3	1.48 (1.15,1.89)	0.002
	Medium	166	4.2		
	High	114	13.2		

Table H-2-12. (Continued)
Interaction Table for SCL-90-R Global Severity Index

e) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Current Alcohol Use: Table 12-17)					
Current Dioxin Category Summary Statistics				Analysis Results for Log₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.)^b	p-Value
0-1 Drinks/Day	Low	224	7.6	1.10 (0.93,1.29)	0.257
	Medium	216	7.4		
	High	232	15.5		
>1-4 Drinks/Day	Low	58	8.6	0.73 (0.51,1.03)	0.071
	Medium	67	9.0		
	High	46	4.4		
>4 Drinks/Day	Low	5	0.0	0.76 (0.38,1.55)	0.450
	Medium	4	50.0		
	High	6	0.0		

f) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Current Total Household Income: Table 12-17)					
Current Dioxin Category Summary Statistics				Analysis Results for Log₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.)^b	p-Value
≤\$55,000	Low	105	15.2	0.90 (0.76,1.07)	0.250
	Medium	121	14.1		
	High	170	13.5		
>\$55,000	Low	182	3.3	1.38 (1.07,1.78)	0.014
	Medium	166	4.2		
	High	114	13.2		

^a Relative risk for a twofold increase in initial dioxin.

^b Relative risk for a twofold increase in current dioxin.

Note: Model 2: Low = 39-98 ppt; Medium = > 98-232 ppt; High = > 232 ppt.

Model 4: Low = ≤ 8.1 ppt; Medium = > 8.1-20.5 ppt; High = >20.5 ppt.

Models 5 and 6: Low = ≤ 46 ppq; Medium = > 46-128 ppq; High = > 128 ppq.

Table H-2-13.
Interaction Table for SCL-90-R Positive Symptom Total

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Occupation: Table 12-18)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log₂ (Initial Dioxin)	
Stratum	Initial Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.)^a	p-Value
Officer	Low	75	9.3	0.08 (0.01,0.80)	0.032
	Medium	34	0.0		
	High	1	0.0		
Enlisted Flyer	Low	34	5.9	1.65 (0.92,2.98)	0.094
	Medium	43	16.3		
	High	29	17.2		
Enlisted Groundcrew	Low	58	19.0	1.00 (0.78,1.29)	0.999
	Medium	90	10.0		
	High	136	15.4		

b) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Current Total Household Income: Table 12-18)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log₂ (Initial Dioxin)	
Stratum	Initial Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.)^a	p-Value
≤\$55,000	Low	71	16.9	0.95 (0.73,1.25)	0.721
	Medium	83	14.5		
	High	110	15.5		
>\$55,000	Low	96	8.3	1.25 (0.86,1.82)	0.246
	Medium	84	4.8		
	High	56	16.1		

^a Relative risk for a twofold increase in initial dioxin.

Note: Low = 39-98 ppt; Medium = > 98-232 ppt; High = > 232 ppt.

APPENDIX H-3.

Psychology Analysis Tables Occupation Removed from Final Model

This appendix contains results of exposure analyses after occupation has been removed from those final dioxin models (Models 2 through 6) that contained occupation. These analyses are performed to investigate the relationship of the dependent variable to dioxin without removing any effects due to occupation. The format of these tables closely parallels the adjusted panels of Chapter 12 tables. A summary of the tables found in this appendix follows.

Appendix H-3 Table	Chapter 12 Table	Dependent Variable
H-3-1	12-6	Anxiety
H-3-2	12-6	Anxiety (Occupation Removed, Education Added)
H-3-3	12-7	Other Neuroses
H-3-4	12-8	SCL-90-R Anxiety
H-3-5	12-10	SCL-90-R Hostility
H-3-6	12-10	SCL-90-R Hostility (Occupation Removed, Education Added)
H-3-7	12-11	SCL-90-R Interpersonal Sensitivity
H-3-8	12-11	SCL-90-R Interpersonal Sensitivity (Occupation Removed, Education Added)
H-3-9	12-12	SCL-90-R Obsessive-Compulsive Behavior
H-3-10	12-13	SCL-90-R Paranoid Ideation
H-3-11	12-14	SCL-90-R Phobic Anxiety
H-3-12	12-15	SCL-90-R Psychoticism
H-3-13	12-16	SCL-90-R Somatization
H-3-14	12-16	SCL-90-R Somatization (Occupation Removed, Education Added)
H-3-15	12-17	SCL-90-R Global Severity Index
H-3-16	12-18	SCL-90-R Positive Symptom Total
H-3-17	12-18	SCL-90-R Positive Symptom Total (Occupation Removed, Education Added)
H-3-18	12-19	SCL-90-R Positive Symptom Distress Index

Table H-3-1.
Analysis of Anxiety
Occupation Removed from Final Model

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED			
Analysis Results for Log₂ (Initial Dioxin)^a			
n	Adj. Relative Risk (95% C.I.)^b	p-Value	Covariate Remarks
516	1.06 (0.88,1.28)	0.521	AGE (p<0.001) RACE (p=0.070) EMPLOY (p<0.001)

^a Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^b Relative risk for a twofold increase in initial dioxin.

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED				
Dioxin Category	n	Adj. Relative Risk (95% C.I.)^{ab}	p-Value	Covariate Remarks
Comparison	1,044			RACE (p=0.245) INC (p<0.001) MARITAL (p=0.078)
Background RH	364	1.03 (0.72,1.48)	0.855	
Low RH	255	0.89 (0.59,1.34)	0.563	
High RH	257	1.26 (0.88,1.81)	0.199	
Low plus High RH	512	0.97 (0.72,1.31)	0.840	

^a Relative risk and confidence interval relative to Comparisons.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

Note: RH = Ranch Hand.

Comparison: Current Dioxin ≤10 ppt.

Background (Ranch Hand): Current Dioxin ≤10 ppt.

Low (Ranch Hand): Current Dioxin >10 ppt, 10 ppt < Initial Dioxin ≤143 ppt.

High (Ranch Hand): Current Dioxin >10 ppt, Initial Dioxin >143 ppt.

Table H-3-1. (Continued)
Analysis of Anxiety
Occupation Removed from Final Model

c) MODELS 4, 5, AND 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED				
Model ^a	Analysis Results for Log ₂ (Current Dioxin + 1)			
	n	Adj. Relative Risk (95% C.I.) ^b	p-Value	Covariate Remarks
4	887	1.14 (1.01,1.29)	0.037	RACE (p=0.089) EMPLOY (p=0.051) MARITAL (p=0.055)
5	887	1.13 (1.01,1.26)	0.029	RACE (p=0.094) EMPLOY (p=0.049) MARITAL (p=0.057)
6 ^c	886	1.10 (0.98,1.24)	0.104	RACE (p=0.111) EMPLOY (p=0.049) MARITAL (p=0.063)

^a Model 4: Log₂ (lipid-adjusted current dioxin + 1).
Model 5: Log₂ (whole-weight current dioxin + 1).
Model 6: Log₂ (whole-weight current dioxin + 1), adjusted for log₂ total lipids.

^b Relative risk for a twofold increase in current dioxin.

^c Adjusted for log₂ total lipids in addition to covariates specified under "Covariate Remarks" column.

Table H-3-2.
Analysis of Anxiety
Occupation Removed from and Education Added to Final Model

a) MODELS 4, 5, AND 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED				
Model ^a	Analysis Results for Log ₂ (Current Dioxin + 1)			
	n	Adj. Relative Risk (95% C.I.) ^b	p-Value	Covariate Remarks
4	887	1.08 (0.94,1.22)	0.276	RACE (p=0.072) EDUC (p<0.001) EMPLOY (p=0.071) MARITAL (p=0.078)
5	887	1.07 (0.96,1.20)	0.219	RACE (p=0.075) EDUC (p<0.001) EMPLOY (p=0.069) MARITAL (p=0.080)
6 ^c	886	1.04 (0.92,1.18)	0.494	RACE (p=0.091) EDUC (p<0.001) EMPLOY (p=0.068) MARITAL (p=0.089)

^a Model 4: Log₂ (lipid-adjusted current dioxin + 1).

Model 5: Log₂ (whole-weight current dioxin + 1).

Model 6: Log₂ (whole-weight current dioxin + 1), adjusted for log₂ total lipids.

^b Relative risk for a twofold increase in current dioxin.

^c Adjusted for log₂ total lipids in addition to covariates specified under "Covariate Remarks" column.

Table H-3-3.
Analysis of Other Neuroses
Occupation Removed from Final Model

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED				
Dioxin Category	n	Adj. Relative Risk (95% C.I.)^{ab}	p-Value	Covariate Remarks
Comparison	1,022			DXCAT*DRKYR (p=0.017) DXCAT*EDUC (p<0.001) DXCAT*INC (p=0.012) DXCAT*COMBDAYS (p=0.036)
Background RH	352	1.02 (0.77,1.37)**	0.871**	EMPLOY (p=0.176)
Low RH	247	1.30 (0.95,1.79)**	0.101**	MARITAL (p<0.001)
High RH	248	1.25 (0.91,1.73)**	0.093**	
Low plus High RH	495	1.28 (0.99,1.66)**	0.063**	

^a Relative risk and confidence interval relative to Comparisons.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

** Categorized dioxin-by-covariate interactions ($p \leq 0.05$); adjusted relative risk, confidence interval, and p-value derived from a model fitted after deletion of these interactions; refer to Appendix Table H-4-1 for further analysis of these interactions.

Note: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, $10 \text{ ppt} < \text{Initial Dioxin} \leq 143$ ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table H-3-3. (Continued)
Analysis of Other Neuroses
Occupation Removed from Final Model

b) MODELS 4, 5, AND 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED				
Model ^a	Analysis Results for Log ₂ (Current Dioxin + 1)			
	n	Adj. Relative Risk (95% C.I.) ^b	p-Value	Covariate Remarks
4	858	1.05 (0.95,1.16)**	0.372**	CURR*DRKYR (p=0.031) EDUC (p<0.001) EMPLOY (p=0.043) MARITAL (p=0.001) PARENT (p=0.039)
5	858	1.06 (0.97,1.16)**	0.193**	CURR*DRKYR (p=0.010) EDUC (p<0.001) EMPLOY (p=0.039) MARITAL (p=0.001) PARENT (p=0.043)
6 ^c	857	1.00 (0.91,1.11)**	0.921**	CURR*DRKYR (p=0.011) EDUC (p<0.001) EMPLOY (p=0.030) MARITAL (p=0.001) PARENT (p=0.023)

^a Model 4: Log₂ (lipid-adjusted current dioxin + 1).

Model 5: Log₂ (whole-weight current dioxin + 1).

Model 6: Log₂ (whole-weight current dioxin + 1), adjusted for log₂ total lipids.

^b Relative risk for a twofold increase in current dioxin.

^c Adjusted for log₂ total lipids in addition to covariates specified under "Covariate Remarks" column.

** Log₂ (current dioxin + 1)-by-covariate interaction (p≤0.05); adjusted relative risk, confidence interval, and p-value derived after deletion of this interaction; refer to Appendix Table H-4-1 for further analysis of this interaction.

Table H-3-4.
Analysis of SCL-90-R Anxiety
Occupation Removed from Final Model

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED			
Analysis Results for Log ₂ (Initial Dioxin) ^a			
n	Adj. Relative Risk (95% C.I.) ^b	p-Value	Covariate Remarks
500	1.06 (0.83,1.34)**	0.652**	INIT*ALC (p=0.023) DRKYR (p=0.018) EDUC (p=0.086) INC (p=0.007) MARITAL (p=0.046) COMBDAYS (p=0.131)

^a Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^b Relative risk for a twofold increase in initial dioxin.

** Log₂ (initial dioxin)-by-covariate interaction ($0.01 < p \leq 0.05$); adjusted relative risk, confidence interval, and p-value derived from a model fitted after deletion of this interaction; refer to Appendix Table H-4-2 for further analysis of this interaction.

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED				
Dioxin Category	n	Adj. Relative Risk (95% C.I.) ^{ab}	p-Value	Covariate Remarks
Comparison	1,031			DRKYR (p=0.011) INC (p<0.001) EMPLOY (p=0.236)
Background RH	359	1.18 (0.68,2.06)	0.566	
Low RH	249	1.32 (0.74,2.34)	0.345	
High RH	251	1.89 (1.16,3.08)	0.010	
Low plus High RH	500	1.62 (1.07,2.46)	0.022	

^a Relative risk and confidence interval relative to Comparisons.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

Note: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, $10 \text{ ppt} < \text{Initial Dioxin} \leq 143$ ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table H-3-5.
Analysis of SCL-90-R Hostility
Occupation Removed from Final Model

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED				
Dioxin Category	n	Adj. Relative Risk (95% C.I.)^{ab}	p-Value	Covariate Remarks
Comparison	1,031			ALC (p=0.015) DRKYR (p<0.001) INC (p<0.001)
Background RH	359	1.41 (0.78,2.55)	0.261	
Low RH	249	1.08 (0.55,2.15)	0.819	
High RH	251	1.84 (1.07,3.18)	0.027	
Low plus High RH	500	1.49 (0.93,2.40)	0.098	

^a Relative risk and confidence interval relative to Comparisons.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

Note: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

b) MODELS 4, 5, AND 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED				
Model^a	Analysis Results for Log₂ (Current Dioxin + 1)			
	n	Adj. Relative Risk (95% C.I.)^b	p-Value	Covariate Remarks
4	870	1.13 (0.93,1.37)	0.222	AGE (p=0.030) DRKYR (p<0.001) EDUC (p<0.001) EMPLOY (p=0.094)
5	870	1.14 (0.96,1.35)	0.133	AGE (p=0.031) DRKYR (p<0.001) EDUC (p<0.001) EMPLOY (p=0.090)
6 ^c	869	1.09 (0.91,1.31)	0.359	AGE (p=0.022) DRKYR (p<0.001) EDUC (p<0.001) EMPLOY (p=0.077)

^a Model 4: Log₂ (lipid-adjusted current dioxin + 1).

Model 5: Log₂ (whole-weight current dioxin + 1).

Model 6: Log₂ (whole-weight current dioxin + 1), adjusted for log₂ total lipids.

^b Relative risk for a twofold increase in current dioxin.

^c Adjusted for log₂ total lipids in addition to covariates specified under "Covariate Remarks" column.

Table H-3-6.
Analysis of SCL-90-R Hostility
Occupation Removed from and Education Added to Final Model

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED				
Dioxin Category	n	Adj. Relative Risk (95% C.I.) ^{ab}	p-Value	Covariate Remarks
Comparison	1,031			ALC (p=0.015) DRKYR (p<0.001) EDUC (p=0.082) INC (p=0.004)
Background RH	359	1.45 (0.80,2.63)	0.219	
Low RH	249	1.05 (0.53,2.09)	0.888	
High RH	251	1.74 (1.01,3.02)	0.046	
Low plus High RH	500	1.43 (0.89,2.30)	0.144	

^a Relative risk and confidence interval relative to Comparisons.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

Note: RH = Ranch Hand.

Comparison: Current Dioxin \leq 10 ppt.

Background (Ranch Hand): Current Dioxin \leq 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin \leq 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table H-3-7.
Analysis of SCL-90-R Interpersonal Sensitivity
Occupation Removed from Final Model

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED			
Analysis Results for Log_e (Initial Dioxin)^a			
n	Adj. Relative Risk (95% C.I.)^b	p-Value	Covariate Remarks
500	0.99 (0.79,1.24)	0.935	DRKYR (p=0.009) EDUC (p=0.126) INC (p=0.025) MARITAL (p=0.011) PARENT (p=0.017)

^a Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^b Relative risk for a twofold increase in initial dioxin.

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED				
Dioxin Category	n	Adj. Relative Risk (95% C.I.)^{ab}	p-Value	Covariate Remarks
Comparison	1,031			DRKYR (p=0.032) INC (p<0.001) MARITAL (p=0.125)
Background RH	359	1.10 (0.70,1.74)	0.672	
Low RH	249	1.10 (0.67,1.81)	0.703	
High RH	251	1.48 (0.96,2.28)	0.075	
Low plus High RH	500	1.30 (0.91,1.87)	0.152	

^a Relative risk and confidence interval relative to Comparisons.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

Note: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table H-3-8.
Analysis of SCL-90-R Interpersonal Sensitivity
Occupation Removed from and Education Added to Final Model

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED				
Dioxin Category	n	Adj. Relative Risk (95% C.I.)^{ab}	p-Value	Covariate Remarks
Comparison	1,031			DRKYR (p=0.046) EDUC (p=0.047) INC (p<0.001) MARITAL (p=0.116)
Background RH	359	1.13 (0.72,1.79)	0.598	
Low RH	249	1.08 (0.66,1.77)	0.767	
High RH	251	1.41 (0.91,2.17)	0.121	
Low plus High RH	500	1.25 (0.87,1.80)	0.220	

^a Relative risk and confidence interval relative to Comparisons.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

Note: RH = Ranch Hand.

Comparison: Current Dioxin \leq 10 ppt.

Background (Ranch Hand): Current Dioxin \leq 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin \leq 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table H-3-9.
Analysis of SCL-90-R Obsessive-Compulsive Behavior
Occupation Removed from Final Model

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED			
Analysis Results for Log₂ (Initial Dioxin)^a			
n	Adj. Relative Risk (95% C.I.)^b	p-Value	Covariate Remarks
500	1.12 (0.90,1.39)**	0.313**	INIT*INC (p=0.039) ALC (p=0.046) DRKYR (p=0.002) COMBDAYS (p=0.016)

^a Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^b Relative risk for a twofold increase in initial dioxin.

** Log₂ (initial dioxin)-by-covariate interaction ($0.01 < p \leq 0.05$); adjusted relative risk, confidence interval, and p-value derived from a model fitted after deletion of this interaction; refer to Appendix Table H-4-3 for further analysis of this interaction.

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED				
Dioxin Category	n	Adj. Relative Risk (95% C.I.)^{ab}	p-Value	Covariate Remarks
Comparison	1,031			DRKYR (p=0.005) INC (p<0.001) EMPLOY (p=0.108)
Background RH	359	1.59 (1.05,2.40)	0.027	
Low RH	249	0.99 (0.60,1.64)	0.968	
High RH	251	1.43 (0.92,2.22)	0.113	
Low plus High RH	500	1.21 (0.84,1.75)	0.299	

^a Relative risk and confidence interval relative to Comparisons.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

Note: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, $10 \text{ ppt} < \text{Initial Dioxin} \leq 143$ ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table H-3-10.
Analysis of SCL-90-R Paranoid Ideation
Occupation Removed from Final Model

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED				
Dioxin Category	n	Adj. Relative Risk (95% C.I.) ^{ab}	p-Value	Covariate Remarks
Comparison	1,031			DXCAT*MARITAL (p=0.033) RACE (p=0.048) DRKYR (p<0.001) INC (p<0.001)
Background RH	359	1.88 (1.09,3.24)**	0.023**	
Low RH	249	1.27 (0.66,2.44)**	0.465**	
High RH	251	1.83 (1.06,3.18)**	0.031**	
Low plus High RH	500	1.57 (0.98,2.52)**	0.059**	

^a Relative risk and confidence interval relative to Comparisons.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

** Categorized dioxin-by-covariate interaction ($0.01 < p \leq 0.05$); adjusted relative risk, confidence interval, and p-value derived from a model fitted after deletion of this interaction; refer to Appendix Table H-4-4 for further analysis of this interaction.

Note: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, $10 \text{ ppt} < \text{Initial Dioxin} \leq 143$ ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table H-3-10. (Continued)
Analysis of SCL-90-R Paranoid Ideation
Occupation Removed from Final Model

b) MODELS 4, 5, AND 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED				
Model ^a	Analysis Results for Log ₂ (Current Dioxin + 1)			
	n	Adj. Relative Risk (95% C.I.) ^b	p-Value	Covariate Remarks
4	859	0.98 (0.81,1.18)**	0.819**	CURR*MARITAL (p=0.016) CURR*COMBDAYS (p<0.001) DRKYR (p<0.001) EDUC (p=0.270) INC (p=0.002)
5	859	1.01 (0.86,1.18)**	0.943**	CURR*MARITAL (p=0.016) CURR*COMBDAYS (p=0.001) DRKYR (p=0.001) EDUC (p=0.298) INC (p=0.003)
6 ^c	858	0.98 (0.82,1.16)**	0.790**	CURR*MARITAL (p=0.014) CURR*COMBDAYS (p=0.001) DRKYR (p=0.001) EDUC (p=0.288) INC (p=0.002)

^a Model 4: Log₂ (lipid-adjusted current dioxin + 1).
Model 5: Log₂ (whole-weight current dioxin + 1).
Model 6: Log₂ (whole-weight current dioxin + 1), adjusted for log₂ total lipids.

^b Relative risk for a twofold increase in current dioxin.

^c Adjusted for log₂ total lipids in addition to covariates specified under "Covariate Remarks" column.

** Log₂ (current dioxin + 1)-by-covariate interactions (p≤0.05); adjusted relative risk, confidence interval, and p-value derived after deletion of these interactions; refer to Appendix Table H-4-4 for further analysis of these interactions.

Table H-3-11.
Analysis of SCL-90-R Phobic Anxiety
Occupation Removed from Final Model

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED				
Dioxin Category	n	Adj. Relative Risk (95% C.I.)^{ab}	p-Value	Covariate Remarks
Comparison	1,031			AGE (p=0.004) DRKYR (p=0.092) EDUC (p<0.001) INC (p<0.001) EMPLOY (p=0.014) PARENT (p=0.039)
Background RH	359	1.34 (0.83,2.16)	0.229	
Low RH	249	0.78 (0.44,1.39)	0.398	
High RH	251	1.11 (0.69,1.79)	0.659	
Low plus High RH	500	0.96 (0.64,1.44)	0.848	

^a Relative risk and confidence interval relative to Comparisons.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

Note: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

b) MODELS 4, 5, AND 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED				
Analysis Results for Log₂ (Current Dioxin + 1)				
Model^a	n	Adj. Relative Risk (95% C.I.)^b	p-Value	Covariate Remarks
4	870	1.06 (0.90,1.26)	0.494	DRKYR (p=0.078) EDUC (p<0.001) EMPLOY (p=0.006) MARITAL (p=0.045)
5	870	1.06 (0.91,1.22)	0.455	DRKYR (p=0.080) EDUC (p<0.001) EMPLOY (p=0.006) MARITAL (p=0.046)
6 ^c	869	1.01 (0.86,1.18)	0.914	DRKYR (p=0.094) EDUC (p<0.001) EMPLOY (p=0.006) MARITAL (p=0.056)

^a Model 4: Log₂ (lipid-adjusted current dioxin + 1).

Model 5: Log₂ (whole-weight current dioxin + 1).

Model 6: Log₂ (whole-weight current dioxin + 1), adjusted for log₂ total lipids.

^b Relative risk for a twofold increase in current dioxin.

^c Adjusted for log₂ total lipids in addition to covariates specified under "Covariate Remarks" column.

Table H-3-12.
Analysis of SCL-90-R Psychoticism
Occupation Removed from Final Model

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED				
Dioxin Category	n	Adj. Relative Risk (95% C.I.)^{ab}	p-Value	Covariate Remarks
Comparison	1,031			CURR*ALC (p=0.022) AGE (p=0.327) RACE (p=0.016) DRKYR (p=0.016) INC (p<0.001) EMPLOY (p=0.186)
Background RH	359	1.27 (0.82,1.98)**	0.287**	
Low RH	249	0.89 (0.52,1.52)**	0.670**	
High RH	251	1.26 (0.79,2.02)**	0.325**	
Low plus High RH	500	1.08 (0.73,1.58)**	0.699**	

^a Relative risk and confidence interval relative to Comparisons.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

** Categorized dioxin-by-covariate interaction ($0.01 < p \leq 0.05$); adjusted relative risk, confidence interval, and p-value derived from a model fitted after deletion of this interaction; refer to Appendix Table H-4-5 for further analysis of this interaction.

Note: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, $10 \text{ ppt} < \text{Initial Dioxin} \leq 143$ ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table H-3-12. (Continued)
Analysis of SCL-90-R Psychoticism
Occupation Removed from Final Model

b) MODELS 4, 5, AND 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED				
Model ^a	Analysis Results for Log ₂ (Current Dioxin + 1)			
	n	Adj. Relative Risk (95% C.I.) ^b	p-Value	Covariate Remarks
4	859	1.02 (0.87,1.20)	0.778	ALC (p=0.246) DRKYR (p=0.026) INC (p=0.001) EMPLOY (p=0.157)
5	859	1.04 (0.90,1.19)	0.626	ALC (p=0.251) DRKYR (p=0.026) INC (p=0.002) EMPLOY (p=0.149)
6 ^c	858	1.01 (0.87,1.17)	0.929	DRKYR (p=0.008) INC (p=0.002) EMPLOY (p=0.178)

^a Model 4: Log₂ (lipid-adjusted current dioxin + 1).

Model 5: Log₂ (whole-weight current dioxin + 1).

Model 6: Log₂ (whole-weight current dioxin + 1), adjusted for log₂ total lipids.

^b Relative risk for a twofold increase in current dioxin.

^c Adjusted for log₂ total lipids in addition to covariates specified under "Covariate Remarks" column.

Table H-3-13.
Analysis of SCL-90-R Somatization
Occupation Removed from Final Model

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED				
Dioxin Category	n	Adj. Relative Risk (95% C.I.)^{ab}	p-Value	Covariate Remarks
Comparison	1,031			DRKYR (p=0.077) INC (p<0.001) EMPLOY (p=0.097) MARITAL (p=0.141)
Background RH	359	1.47 (0.93,2.32)	0.099	
Low RH	249	1.28 (0.77,2.13)	0.347	
High RH	251	1.65 (1.05,2.59)	0.029	
Low plus High RH	500	1.47 (1.01,2.15)	0.043	

^a Relative risk and confidence interval relative to Comparisons.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

Note: RH = Ranch Hand.

Comparison: Current Dioxin \leq 10 ppt.

Background (Ranch Hand): Current Dioxin \leq 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin \leq 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table H-3-14.
Analysis of SCL-90-R Somatization
Occupation Removed from and Education Added to Final Model

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED				
Dioxin Category	n	Adj. Relative Risk (95% C.I.)^{ab}	p-Value	Covariate Remarks
Comparison	1,031			DRKYR (p=0.111) EDUC (p=0.015) INC (p<0.001) EMPLOY (p=0.083) MARITAL (p=0.124)
Background RH	359	1.51 (0.96,2.39)	0.077	
Low RH	249	1.24 (0.74,2.07)	0.408	
High RH	251	1.55 (0.99,2.45)	0.056	
Low plus High RH	500	1.41 (0.96,2.06)	0.076	

^a Relative risk and confidence interval relative to Comparisons.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

Note: RH = Ranch Hand.

Comparison: Current Dioxin \leq 10 ppt.

Background (Ranch Hand): Current Dioxin \leq 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin \leq 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table H-3-15.
Analysis of SCL-90-R Global Severity Index
Occupation Removed from Final Model

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED				
Dioxin Category	n	Adj. Relative Risk (95% C.I.)^{ab}	p-Value	Covariate Remarks
Comparison	1,031			DRKYR (p=0.006) EDUC (p=0.003) INC (p<0.001) EMPLOY (p=0.248) MARITAL (p=0.004)
Background RH	359	1.34 (0.83,2.14)	0.228	
Low RH	249	1.13 (0.67,1.90)	0.640	
High RH	251	1.57 (1.01,2.46)	0.047	
Low plus High RH	500	1.37 (0.94,1.99)	0.105	

^a Relative risk and confidence interval relative to Comparisons.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

Note: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table H-3-16.
Analysis of SCL-90-R Positive Symptom Total
Occupation Removed from Final Model

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED			
Analysis Results for Log ₂ (Initial Dioxin) ^a			
n	Adj. Relative Risk (95% C.I.) ^b	p-Value	Covariate Remarks
500	1.04 (0.84,1.29)**	0.698**	INIT*INC (p=0.036) ALC (p=0.051) DRKYR (p=0.002) EDUC (p=0.090) MARITAL (p=0.005) PARENT (p=0.081)

^a Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^b Relative risk for a twofold increase in initial dioxin.

** Log₂ (initial dioxin)-by-covariate interaction ($0.01 < p \leq 0.05$); adjusted relative risk, confidence interval, and p-value derived from a model fitted after deletion of this interaction; refer to Appendix Table H-4-6 for further analysis of this interaction.

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED				
Dioxin Category	n	Adj. Relative Risk (95% C.I.) ^{ab}	p-Value	Covariate Remarks
Comparison	1,031			DRKYR (p=0.003) INC (p<0.001) EMPLOY (p=0.179) MARITAL (p=0.017)
Background RH	359	1.19 (0.77,1.84)	0.433	
Low RH	249	1.13 (0.70,1.82)	0.616	
High RH	251	1.47 (0.97,2.25)	0.072	
Low plus High RH	500	1.31 (0.92,1.86)	0.133	

^a Relative risk and confidence interval relative to Comparisons.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

Note: RH = Ranch Hand.

Comparison: Current Dioxin \leq 10 ppt.

Background (Ranch Hand): Current Dioxin \leq 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin \leq 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table H-3-17.
Analysis of SCL-90-R Positive Symptom Total
Occupation Removed from and Education Added to Final Model

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED				
Dioxin Category	n	Adj. Relative Risk (95% C.I.)^{ab}	p-Value	Covariate Remarks
Comparison	1,031			DRKYR (p=0.006) EDUC (p=0.028) INC (p<0.001) EMPLOY (p=0.157) MARITAL (p=0.015)
Background RH	359	1.23 (0.79,1.90)	0.363	
Low RH	249	1.11 (0.69,1.78)	0.678	
High RH	251	1.40 (0.91,2.14)	0.126	
Low plus High RH	500	1.31 (0.92,1.86)	0.202	

^a Relative risk and confidence interval relative to Comparisons.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

Note: RH = Ranch Hand.

Comparison: Current Dioxin \leq 10 ppt.

Background (Ranch Hand): Current Dioxin \leq 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin \leq 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table H-3-18.
Analysis of SCL-90-R Positive Symptom Distress Index
Occupation Removed from Final Model

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED				
Dioxin Category	n	Adj. Relative Risk (95% C.I.) ^{ab}	p-Value	Covariate Remarks
Comparison	1,046			INC (p<0.001) PARENT (p=0.015)
Background RH	366	0.94 (0.57,1.55)	0.800	
Low RH	255	1.06 (0.63,1.79)	0.819	
High RH	258	1.21 (0.75,1.97)	0.435	
Low plus High RH	513	1.14 (0.77,1.69)	0.512	

^a Relative risk and confidence interval relative to Comparisons.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

Note: RH = Ranch Hand.

Comparison: Current Dioxin ≤10 ppt.

Background (Ranch Hand): Current Dioxin ≤10 ppt.

Low (Ranch Hand): Current Dioxin >10 ppt, 10 ppt < Initial Dioxin ≤143 ppt.

High (Ranch Hand): Current Dioxin >10 ppt, Initial Dioxin >143 ppt.

APPENDIX H-4.

Interaction Tables for the Psychological Assessment Occupation Removed from Final Model

This appendix contains exposure analyses results of interactions between covariates and dioxin after occupation has been removed from those final dioxin models (Models 2 through 6) that contained occupation. These tables are supplements to tables in Appendix H-3, which are main effects results with occupation removed from the model. Results are presented for separate strata of the covariate and include sample sizes, percent abnormal, relative risks, confidence intervals, and p-values. Chapter 7, Statistical Methods, provides further details on the analytical approaches used in the interaction analyses. The analysis model, covariate involved in the interaction, and a reference to the analysis tables in Chapter 12 and Appendix H-3 are given in the heading of each subtable. A summary of the interactions described in this appendix follows.

Appendix H-4 Table	Chapter 12 Table	Appendix H-3 Table	Dependent Variable	Model	Covariate
H-4-1	12-7	H-3-3	Other Neuroses	3	Lifetime Alcohol History, Education, Current Total Household Income, Combat Service
				4	Lifetime Alcohol History
				5	Lifetime Alcohol History
				6	Lifetime Alcohol History
H-4-2	12-8	H-3-4	SCL-90-R Anxiety	2	Current Alcohol Use
H-4-3	12-12	H-3-9	SCL-90-R Obsessive-Compulsive Behavior	2	Current Total Household Income
H-4-4	12-13	H-3-10	SCL-90-R Paranoid Ideation	3	Current Marital Status
				4	Current Marital Status, Combat Service
				5	Current Marital Status, Combat Service
				6	Current Marital Status, Combat Service
H-4-5	12-15	H-3-12	SCL-90-R Psychoticism	3	Current Alcohol Use
H-4-6	12-18	H-3-16	SCL-90-R Positive Symptom Total	2	Current Total Household Income

Table H-4-1.
Interaction Table for Other Neuroses
Occupation Removed from Final Model

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Lifetime Alcohol History: Tables 12-7 and H-3-3)					
Stratum	Dioxin Category	n	Percent Yes	Adjusted Relative Risk (95% C.I.)^a	p-Value
0 Drink-years	Comparison	53	28.3		
	Background RH	19	31.6	1.04 (0.33,3.33)	0.947
	Low RH	14	28.6	0.94 (0.25,3.57)	0.932
	High RH	24	41.7	1.48 (0.52,4.19)	0.457
	Low plus High RH	38	36.8	1.27 (0.51,3.18)	0.611
>0-40 Drink-years	Comparison	696	33.9		
	Background RH	251	30.7	0.99 (0.70,1.39)	0.947
	Low RH	165	40.6	1.32 (0.90,1.93)	0.149
	High RH	161	42.9	1.29 (0.88,1.90)	0.186
	Low plus High RH	326	41.7	1.31 (0.96,1.78)	0.084
>40 Drink-years	Comparison	273	50.6		
	Background RH	82	51.2	1.16 (0.69,1.94)	0.581
	Low RH	68	54.4	1.26 (0.72,2.21)	0.412
	High RH	63	58.7	1.14 (0.63,2.05)	0.672
	Low plus High RH	131	56.5	1.20 (0.77,1.89)	0.422

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Education: Tables 12-7 and H-3-3)					
Stratum	Dioxin Category	n	Percent Yes	Adjusted Relative Risk (95% C.I.)^a	p-Value
High School	Comparison	474	40.5		
	Background RH	115	53.9	1.87 (1.20,2.91)	0.006
	Low RH	122	52.5	1.73 (1.12,2.68)	0.013
	High RH	171	52.1	1.60 (1.08,2.38)	0.019
	Low plus High RH	293	52.2	1.66 (1.18,2.32)	0.003
College	Comparison	548	36.0		
	Background RH	237	26.6	0.69 (0.48,1.00)	0.049
	Low RH	125	35.2	1.01 (0.66,1.55)	0.965
	High RH	77	35.1	0.93 (0.55,1.57)	0.790
	Low plus High RH	202	35.2	0.98 (0.68,1.41)	0.910

Table H-4-1. (Continued)
Interaction Table for Other Neuroses
Occupation Removed from Final Model

c) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Current Total Household Income: Tables 12-7 and H-3-3)					
Stratum	Dioxin Category	n	Percent Yes	Adjusted Relative Risk (95% C.I.)^a	p-Value
≤\$55,000	Comparison	501	45.3		
	Background RH	129	45.7	1.02 (0.67,1.56)	0.923
	Low RH	103	54.4	1.45 (0.92,2.31)	0.111
	High RH	158	43.7	0.89 (0.59,1.33)	0.567
	Low plus High RH	261	47.9	1.08 (0.77,1.52)	0.646
>\$55,000	Comparison	521	31.1		
	Background RH	223	29.6	1.00 (0.70,1.45)	0.983
	Low RH	144	36.1	1.23 (0.82,1.86)	0.319
	High RH	90	52.2	2.36 (1.46,3.83)	<0.001
	Low plus High RH	234	42.3	1.59 (1.13,2.25)	0.008

d) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Combat Service: Tables 12-7 and H-3-3)					
Stratum	Dioxin Category	n	Percent Yes	Adjusted Relative Risk (95% C.I.)^a	p-Value
<360 Days	Comparison	789	37.9		
	Background RH	64	42.2	1.17 (0.68,2.01)	0.566
	Low RH	26	26.9	0.46 (0.18,1.16)	0.102
	High RH	26	57.7	2.00 (0.88,4.56)	0.097
	Low plus High RH	52	42.3	1.00 (0.55,1.82)	0.990
≥360 Days	Comparison	233	38.6		
	Background RH	288	34.0	0.92 (0.63,1.34)	0.655
	Low RH	221	45.7	1.35 (0.91,1.99)	0.137
	High RH	222	45.5	1.10 (0.74,1.63)	0.649
	Low plus High RH	443	45.6	1.22 (0.86,1.71)	0.262

Table H-4-1. (Continued)
Interaction Table for Other Neuroses
Occupation Removed from Final Model

e) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Lifetime Alcohol History: Tables 12-7 and H-3-3)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent Yes	Adjusted Relative Risk (95% C.I.) ^b	p-Value
0 Drink-years	Low	17	23.5	1.15 (0.81,1.62)	0.446
	Medium	18	27.8		
	High	23	47.8		
> 0-40 Drink-years	Low	202	29.7	1.08 (0.95,1.22)	0.223
	Medium	194	38.7		
	High	189	43.4		
> 40 Drink-years	Low	66	47.0	0.96 (0.79,1.17)	0.704
	Medium	77	59.7		
	High	72	55.6		

f) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Lifetime Alcohol History: Tables 12-7 and H-3-3)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent Yes	Adjusted Relative Risk (95% C.I.) ^b	p-Value
0 Drink-years	Low	18	33.3	1.17 (0.86,1.58)	0.320
	Medium	14	21.4		
	High	26	42.3		
> 0-40 Drink-years	Low	204	28.9	1.09 (0.98,1.22)	0.101
	Medium	199	38.2		
	High	182	45.1		
> 40 Drink-years	Low	67	46.3	0.97 (0.83,1.13)	0.682
	Medium	74	59.5		
	High	74	56.8		

Table H-4-1. (Continued)
Interaction Table for Other Neuroses
Occupation Removed from Final Model

g) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Lifetime Alcohol History: Tables 12-7 and H-3-3)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent Yes	Adjusted Relative Risk (95% C.I.) ^b	p-Value
0 Drink-years	Low	18	33.3	1.08 (0.80,1.45)	0.628
	Medium	14	21.4		
	High	26	42.3		
>0-40 Drink-years	Low	203	28.6	1.04 (0.93,1.17)	0.469
	Medium	199	38.2		
	High	182	45.1		
>40 Drink-years	Low	67	46.3	0.91 (0.78,1.07)	0.270
	Medium	74	59.5		
	High	74	56.8		

^a Relative risk and confidence interval relative to Comparisons.

^b Relative risk for a twofold increase in current dioxin.

Note: Model 3: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Model 4: Low = ≤ 8.1 ppt; Medium = > 8.1-20.5 ppt; High = > 20.5 ppt.

Models 5 and 6: Low = ≤ 46 ppq; Medium = > 46-128 ppq; High = > 128 ppq.

Table H-4-2.
Interaction Table for SCL-90-R Anxiety
Occupation Removed from Final Model

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Current Alcohol Use: Tables 12-8 and H-3-4)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Initial Dioxin)	
Stratum	Initial Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.) ^a	p-Value
0-1 Drinks/Day	Low	126	6.4	1.20 (0.93,1.55)	0.167
	Medium	134	9.7		
	High	136	13.2		
>1 Drink/Day	Low	41	9.8	0.44 (0.19,1.03)	0.058
	Medium	33	6.1		
	High	30	3.3		

^a Relative risk for a twofold increase in initial dioxin.

Note: Low = 39-98 ppt; Medium = >98-232 ppt; High = >232 ppt.

Table H-4-3.
Interaction Table for SCL-90-R Obsessive-Compulsive Behavior
Occupation Removed from Final Model

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Current Total Household Income: Tables 12-12 and H-3-9)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Initial Dioxin)	
Stratum	Initial Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.) ^a	p-Value
≤\$55,000	Low	71	15.5	1.04 (0.79,1.36)	0.778
	Medium	83	8.4		
	High	110	13.6		
>\$55,000	Low	96	7.3	1.32 (0.93,1.88)	0.122
	Medium	84	8.3		
	High	56	12.5		

^a Relative risk for a twofold increase in initial dioxin.

Note: Low = 39-98 ppt; Medium = >98-232 ppt; High = >232 ppt.

Table H-4-4.
Interaction Table for SCL-90-R Paranoid Ideation
Occupation Removed from Final Model

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Current Marital Status: Tables 12-13 and H-3-10)					
Stratum	Dioxin Category	n	Percent High	Adjusted Relative Risk (95% C.I.) ^a	p-Value
Married	Comparison	894	3.9		
	Background RH	317	6.6	2.07 (1.16,3.68)	0.014
	Low RH	216	4.6	1.18 (0.57,2.44)	0.663
	High RH	213	5.6	1.20 (0.60,2.39)	0.599
	Low plus High RH	429	5.1	1.19 (0.68,2.07)	0.542
Not Married	Comparison	137	5.8		
	Background RH	42	4.8	0.93 (0.18,4.72)	0.926
	Low RH	33	9.1	1.69 (0.40,7.08)	0.474
	High RH	38	26.3	5.37 (1.87,15.42)	0.002
	Low plus High RH	71	18.3	3.57 (1.36,9.38)	0.010

b) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Current Marital Status: Table 12-13 and H-3-10)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.) ^b	p-Value
Married	Low	249	6.8	0.87 (0.70,1.08)	0.202
	Medium	250	4.0		
	High	247	6.5		
Not Married	Low	35	2.9	1.40 (0.95,2.07)	0.087
	Medium	37	10.8		
	High	41	24.4		

Table H-4-4. (Continued)
Interaction Table for SCL-90-R Paranoid Ideation
Occupation Removed from Final Model

c) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Combat Service: Table 12-13 and H-3-10)					
Current Dioxin Category Summary Statistics				Analysis Results for Log₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.)^b	p-Value
0-360 Days	Low	55	9.1	0.80 (0.44,1.45)	0.460
	Medium	33	3.0		
	High	29	3.5		
>360 Days	Low	229	5.7	0.98 (0.80,1.19)	0.824
	Medium	254	5.1		
	High	259	9.7		

d) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Current Marital Status: Table 12-13 and H-3-10)					
Current Dioxin Category Summary Statistics				Analysis Results for Log₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.)^b	p-Value
Married	Low	250	6.8	0.91 (0.76,1.09)	0.300
	Medium	250	4.8		
	High	246	5.7		
Not Married	Low	38	2.6	1.39 (0.98,1.96)	0.066
	Medium	37	13.5		
	High	38	23.7		

e) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Combat Service: Table 12-13 and H-3-10)					
Current Dioxin Category Summary Statistics				Analysis Results for Log₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.)^b	p-Value
0-360 Days	Low	57	8.8	0.86 (0.53,1.38)	0.522
	Medium	28	3.6		
	High	32	3.1		
>360 Days	Low	231	5.6	1.01 (0.85,1.19)	0.938
	Medium	259	6.2		
	High	252	8.7		

Table H-4-4. (Continued)
Interaction Table for SCL-90-R Paranoid Ideation
Occupation Removed from Final Model

f) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Current Marital Status: Table 12-13 and H-3-10)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.) ^b	p-Value
Married	Low	249	6.8	0.89 (0.73,1.07)	0.213
	Medium	250	4.8		
	High	246	5.7		
Not Married	Low	38	2.6	1.35 (0.94,1.93)	0.099
	Medium	37	13.5		
	High	38	23.7		

g) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Combat Service: Table 12-13 and H-3-10)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.) ^b	p-Value
0-360 Days	Low	57	8.8	0.83 (0.52,1.33)	0.442
	Medium	28	3.6		
	High	32	3.1		
>360 Days	Low	230	5.7	0.98 (0.81,1.17)	0.788
	Medium	259	6.2		
	High	252	8.7		

^a Relative risk and confidence interval relative to Comparisons.

^b Relative risk for a twofold increase in current dioxin.

Note: Model 3: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Model 4: Low = ≤ 8.1 ppt; Medium = > 8.1-20.5 ppt; High = > 20.5 ppt.

Models 5 and 6: Low = ≤ 46 ppq; Medium = > 46-128 ppq; High = > 128 ppq.

Table H-4-5.
Interaction Table for SCL-90-R Psychoticism
Occupation Removed from Final Model

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Current Alcohol Use: Tables 12-15 and H-3-12)					
Stratum	Dioxin Category	n	Percent High	Adjusted Relative Risk (95% C.I.) ^a	p-Value
0-1 Drinks/ Day	Comparison	818	8.1		
	Background RH	277	6.9	0.93 (0.54,1.60)	0.794
	Low RH	190	7.9	0.89 (0.49,1.61)	0.692
	High RH	206	11.7	1.37 (0.82,2.28)	0.226
	Low plus High RH	396	9.9	1.13 (0.74,1.73)	0.572
>1-4 Drinks/ Day	Comparison	179	7.8		
	Background RH	75	14.7	2.29 (0.96,5.46)	0.061
	Low RH	56	5.4	0.67 (0.18,2.44)	0.539
	High RH	40	10.0	0.88 (0.27,2.94)	0.841
	Low plus High RH	96	7.3	0.77 (0.30,2.02)	0.597
>4 Drinks/ Day	Comparison	34	8.8		
	Background RH	7	28.6	6.89 (0.85,55.48)	0.070
	Low RH	3	33.3	5.16 (0.27,97.48)	0.274
	High RH	5	0.0	--	--
	Low plus High RH	8	12.5	1.20 (0.10,15.11)	0.887

^a Relative risk and confidence interval relative to Comparisons.

--: Adjusted relative risk, confidence interval, and p-value not presented due to the sparse number of abnormalities.

Note: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt $<$ Initial Dioxin ≤ 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table H-4-6.
Interaction Table for Positive Symptom Total
Occupation Removed from Final Model

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Current Total Household Income: Tables 12-18 and H-3-16)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log _e (Initial Dioxin)	
Stratum	Initial Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.) ^a	p-Value
≤\$55,000	Low	71	16.9	0.96 (0.74,1.25)	0.768
	Medium	83	14.5		
	High	110	15.5		
>\$55,000	Low	96	8.3	1.26 (0.81,1.97)	0.304
	Medium	84	4.8		
	High	56	16.1		

^a Relative risk for a twofold increase in initial dioxin.

Note: Model 2: Low = 39-98 ppt; Medium = >98-232 ppt; High = >232 ppt.

APPENDIX I-1.

Dependent Variable-Covariate Associations for Gastrointestinal Assessment

Appendix I-1-1 displays the diagnoses for all participants who reported "yes" to skin bruises, patches, or sensitivity. The history of skin bruises, patches, or sensitivity was intended to be a surrogate measure for symptoms of porphyria cutanea tarda (PCT), but the diagnoses for each individual included a broad range of conditions not related to PCT.

Appendix I-1-2 contains results of tests of association between each dependent variable and candidate covariates for the adjusted analysis. Pearson's chi-square test (continuity-adjusted for 2×2 tables) is used for the significance testing of the associations between each discrete dependent variable and the candidate covariate. When a candidate covariate is continuous in nature (e.g., age), the covariate is discretized prior to the analysis of the discrete dependent variable. Pearson's correlation coefficient is used for significance testing of the associations between each continuous dependent variable and a continuous candidate covariate. When a candidate covariate is discrete in nature and the dependent variable is continuous, means (transformed back to the original scale, if necessary) are presented and an analysis of variance is used to investigate the difference between the means.

Table I-1-1.
**Frequencies of Diagnoses for Participants Reporting "Yes" to Skin Bruising,
 Skin Patches, and Sensitivity**

ICD Code	Description	Total Count	Patches	Bruises	Sensitivity
01190	Unspecified Pulmonary Tuberculosis, Unspecified Examination	1	0	0	1
0539	Herpes Zoster without Mention of Complication	8	6	0	2
0549	Herpes Simplex without Mention of Complication	2	2	0	0
0780	Molluscum Contagiosum	1	0	0	1
0781	Viral Warts	7	5	0	2
1100	Dermatophytosis of Scalp and Beard	2	2	0	0
1102	Dermatophytosis of Hand	11	6	0	5
1103	Dermatophytosis of Groin and Perianal Area	9	7	0	2
1104	Dermatophytosis of Foot	25	18	1	6
1105	Dermatophytosis of the Body	4	4	0	0
1108	Dermatophytosis of Other Specified Sites	15	11	0	4
1109	Dermatophytosis of Unspecified Site	5	4	0	1
1110	Pityriasis Versicolor	65	62	0	3
1119	Dermatomycosis, Unspecified	5	5	0	0
1123	Candidiasis of Skin and Nails	1	1	0	0
1179	Other and Unspecified Mycoses	11	10	1	0
1330	Scabies	1	0	0	1
1707	Malignant Neoplasm of Long Bones of Lower Limb	1	1	0	0
1710	Malignant Neoplasm, Connective and Soft Tissue of Head, Face, Neck	1	1	0	0
1725	Malignant Melanoma of Skin of Trunk, Except Scrotum	1	1	0	0
1726	Malignant Melanoma of Skin of Upper Limb, Including Shoulder	1	1	0	0
1732	Other Malignant Neoplasm of Skin of Ear, External Ear Canal	1	1	0	0
1733	Other Malignant Neoplasm of Skin of Other and Unspecified Parts of Face	15	13	0	2
1734	Other Malignant Neoplasm of Scalp and Skin of Neck	3	2	0	1
1735	Other Malignant Neoplasm of Skin of Trunk, Except Scrotum	5	5	0	0
1736	Other Malignant Neoplasm, Skin of Upper Limb, Including Shoulder	5	4	0	1
1955	Malignant Neoplasm of Lower Limb	1	0	1	0

Table I-1-1. (Continued)
**Frequencies of Diagnoses for Participants Reporting "Yes" to Skin Bruising,
Skin Patches, and Sensitivity**

ICD Code	Description	Total Count	Patches	Bruises	Sensitivity
2141	Lipoma of Other Skin and Subcutaneous Tissue	2	2	0	0
2149	Lipoma, Unspecified Site	1	1	0	0
2162	Benign Neoplasm of Ear and External Auditory Canal	2	2	0	0
2163	Benign Neoplasm of Skin of Other & Unspecified Parts of Face	7	6	0	1
2164	Benign Neoplasm of Scalp and Skin of Neck	1	1	0	0
2165	Benign Neoplasm of Skin of Trunk, Except Scrotum	13	12	0	1
2166	Benign Neoplasm of Skin of Upper Limb, Including Shoulder	4	4	0	0
2167	Benign Neoplasm of Skin of Lower Limb, Including Hip	1	1	0	0
22801	Hemangioma of Skin and Subcutaneous Tissue	3	2	1	0
22809	Hemangioma of Other Sites	1	0	0	1
2323	Carcinoma In Situ of Skin of Face, Other, and Unspecified Parts	1	1	0	0
2324	Carcinoma In Situ of Scalp and Skin of Neck	1	1	0	0
25000	Diabetes Mellitus without Mention of Complication, Adult Onset	6	1	4	1
25001	Diabetes Mellitus without Mention of Complication, Juvenile Type	3	0	2	1
25060	Diabetes With Neurological Manifestations, Adult Onset	4	2	0	2
2532	Panhypopituitarism	1	0	1	0
2572	Other Testicular Hypofunction	1	0	0	1
2722	Mixed Hyperlipidemia	1	1	0	0
2729	Unspecified Disorder of Lipoid Metabolism	1	0	1	0
2750	Disorders of Iron Metabolism	1	1	0	0
2768	Hypopotassemia	1	0	1	0
2771	Disorders of Porphyrin Metabolism	1	0	0	1
2865	Hemorrhagic Disorder Due to Circulating Anticoagulants	1	0	1	0
2872	Other Nonthrombocytopenic Purpuras	1	0	1	0
2874	Secondary Thrombocytopenia	1	0	1	0

Table I-1-1. (Continued)
**Frequencies of Diagnoses for Participants Reporting "Yes" to Skin Bruising,
Skin Patches, and Sensitivity**

ICD Code	Description	Total Count	Patches	Bruises	Sensitivity
2875	Thrombocytopenia, Unspecified	1	0	1	0
30391	Alcohol Dependence, Other and Unspecified, Continuous Use	1	0	0	1
316	Psychic Factors Associated with Diseases Classified Elsewhere	1	1	0	0
3320	Paralysis Agitans	1	0	0	1
3510	Bell's Palsy	1	0	0	1
3540	Carpal Tunnel Syndrome	1	0	0	1
3542	Lesion of Ulnar Nerve	1	0	0	1
3550	Lesion of Sciatic Nerve	1	0	1	0
3558	Mononeuritis of Lower Limb, Unspecified	2	0	0	2
3572	Polyneuropathy In Diabetes	3	3	0	0
37024	Photokeratitis	1	1	0	0
38010	Infective Otitis Externa, Unspecified	1	0	0	1
4019	Essential Hypertension, Not Otherwise Specified	3	0	2	1
41010	Acute Myocardial Infarction, Other Anterior Wall, Episode of Care Unspecified	1	0	1	0
41041	Acute Myocardial Infarction, Other Inferior Wall, Initial Episode of Care	1	0	1	0
4140	Coronary Atherosclerosis	3	0	3	0
4241	Aortic Valve Disorders	1	0	1	0
4409	Generalized and Unspecified Atherosclerosis	2	1	1	0
4420	Aneurysm of Artery of Upper Extremity	1	0	0	1
4430	Raynaud's Syndrome	2	0	0	2
44389	Other Peripheral Vascular Disease	1	0	1	0
4439	Peripheral Vascular Disease, Unspecified	2	1	0	1
4476	Arteritis, Unspecified	3	2	1	0
4478	Other Specified Disorders of Arteries and Arterioles	1	0	0	1
4481	Nevus, Non-Neoplastic	4	3	1	0
4512	Phlebitis, Thrombophlebitis, Lower Extremities, Not Otherwise Specified	3	0	2	1
4519	Phlebitis, Thrombophlebitis, Unspecified Site	2	0	2	0

Table I-1-1. (Continued)
**Frequencies of Diagnoses for Participants Reporting "Yes" to Skin Bruising,
 Skin Patches, and Sensitivity**

ICD Code	Description	Total Count	Patches	Bruises	Sensitivity
4541	Varicose Veins, Lower Extremities, with Inflammation	3	3	0	0
4549	Varicose Veins, Lower Extremities, Ulcer or Inflammation Not Mentioned	1	1	0	0
45981	Venous (Peripheral) Insufficiency, Unspecified	4	2	2	0
45989	Other Specified Circulatory System Disorders	4	0	4	0
515	Postinflammatory Pulmonary Fibrosis	1	0	1	0
5285	Diseases of Lips	1	1	0	0
5286	Leukoplakia of Oral Mucosa, Including Tongue	2	2	0	0
5570	Acute Vascular Insufficiency of Intestine	1	0	1	0
5733	Hepatitis, Unspecified	2	1	0	1
6039	Hydrocele, Unspecified	1	1	0	0
6806	Carbuncle and Furuncle of Leg, Except Foot	1	0	0	1
6826	Cellulitis and Abscess of Leg, Except Foot	3	2	0	1
6828	Cellulitis and Abscess of Other Specified Sites	1	1	0	0
6829	Cellulitis and Abscess of Unspecified Sites	1	1	0	0
684	Impetigo	2	1	1	0
6860	Pyoderma	1	1	0	0
6861	Pyogenic Granuloma of Skin and Subcutaneous Tissue	1	1	0	0
6869	Unspecified Local Infection of Skin and Subcutaneous Tissue	3	2	0	1
690	Erythematousquamous Dermatitis	30	25	1	4
6918	Other Atopic Dermatitis and Related Conditions	3	2	0	1
6920	Contact Dermatitis and Other Eczema Due to Detergents	1	1	0	0
6921	Contact Dermatitis and Other Eczema Due to Oils and Greases	1	1	0	0
6922	Contact Dermatitis and Other Eczema Due to Solvents	1	1	0	0
6924	Contact Dermatitis and Other Eczema Due to Other Chemical	2	1	0	1
6926	Contact Dermatitis and Other Eczema Due to Plants (Except Food)	3	2	0	1
69270	Unspecified Dermatitis Due to Sun	6	3	0	3

Table I-1-1. (Continued)
**Frequencies of Diagnoses for Participants Reporting "Yes" to Skin Bruising,
Skin Patches, and Sensitivity**

ICD Code	Description	Total Count	Patches	Bruises	Sensitivity
69271	Sunburn	3	3	0	0
69279	Other Dermatitis Due to Sun	4	3	0	1
69289	Contact Dermatitis, Eczema Due to Other Specified Agents	1	1	0	0
6929	Contact Dermatitis and Other Eczema, Unspecified Cause	94	62	6	26
6930	Dermatitis Due to Drugs and Medicines Taken Internally	2	2	0	0
6931	Dermatitis Due to Food Taken Internally	1	1	0	0
6950	Toxic Erythema	1	1	0	0
6951	Erythema Multiforme	1	1	0	0
6953	Rosacea	4	4	0	0
69589	Other Specified Erythematous Conditions	4	3	0	1
6959	Unspecified Erythematous Condition	9	7	0	2
6961	Other Psoriasis and Similar Disorders	37	31	2	4
6962	Parapsoriasis	2	2	0	0
6963	Pityriasis Rosea	6	5	0	1
6965	Other and Unspecified Pityriasis	1	1	0	0
6970	Lichen Planus	8	6	2	0
6980	Pruritus Ani	1	0	0	1
6983	Lichenification and Lichen Simplex Chronicus	15	9	1	5
6984	Dermatitis Factitia (Artefacta)	2	2	0	0
6989	Unspecified Pruritic Disorder	3	1	0	2
700	Corns and Callosities	2	1	1	0
7011	Keratoderma, Acquired	25	17	2	6
7013	Striae Atrophicae	5	2	2	1
7014	Keloid Scar	1	0	0	1
7018	Other Specified Hypertrophic and Atrophic Conditions of Skin	3	2	1	0
7020	Actinic Keratosis	202	171	12	19
702	Seborrheic Keratosis	8	8	0	0

Table I-1-1. (Continued)
**Frequencies of Diagnoses for Participants Reporting "Yes" to Skin Bruising,
Skin Patches, and Sensitivity**

ICD Code	Description	Total Count	Patches	Bruises	Sensitivity
7028	Other Specified Dermatoses	1	1	0	0
7038	Other Specified Diseases of Nail	2	0	1	1
70401	Alopecia Areata	3	2	0	1
7048	Other Specified Diseases of Hair and Hair Follicles	12	8	0	4
7051	Prickly Heat	4	4	0	0
70581	Dyshidrosis	5	5	0	0
7060	Acne Varioliformis	3	3	0	0
7061	Other Acne	11	6	1	4
7062	Sebaceous Cyst	10	9	0	1
7063	Seborrhea	6	4	1	1
7068	Other Specified Diseases of Sebaceous Glands	6	4	1	1
7070	Decubitus Ulcer	1	0	1	0
7079	Chronic Ulcer of Unspecified Site	2	1	1	0
7080	Allergic Urticaria	2	2	0	0
7083	Dermatographic Urticaria	2	1	0	1
7088	Other Specified Urticaria	1	0	0	1
7089	Unspecified Urticaria	5	3	0	2
7090	Dyschromia	63	57	4	2
7091	Vascular Disorders of Skin	1	1	0	0
7093	Degenerative Skin Disorders	1	1	0	0
7098	Other Specified Disorders of Skin	11	9	1	1
7099	Unspecified Disorder of Skin and Subcutaneous Tissue	17	11	2	4
7101	Systemic Sclerosis	1	0	0	1
7140	Rheumatoid Arthritis	1	0	1	0
71590	Osteoarthritis, Unspecified Involving Unspecified Site	1	0	1	0
71596	Osteoarthritis, Unspecified Involving Lower Leg	2	0	1	1
71690	Unspecified Arthropathy, Site Unspecified	1	0	1	0
71693	Unspecified Arthropathy Involving Forearm	1	0	1	0
71696	Unspecified Arthropathy Involving Lower Leg	1	0	1	0
71699	Unspecified Arthropathy Involving Multiple Sites	1	0	0	1

Table I-1-1. (Continued)
**Frequencies of Diagnoses for Participants Reporting "Yes" to Skin Bruising,
Skin Patches, and Sensitivity**

ICD Code	Description	Total Count	Patches	Bruises	Sensitivity
71941	Pain In Joint Involving Shoulder Region	1	0	0	1
72190	Spondylosis of Unspecified Site without Mention of Myelopathy	1	0	0	1
72252	Degeneration of Lumbar or Lumbosacral Intervertebral Disc	1	0	0	1
7234	Brachial Neuritis or Radiculitis Not Otherwise Specified	1	0	0	1
7244	Thoracic or Lumbosacral Neuritis or Radiculitis, Unspecified	1	0	0	1
72610	Disorders, Bursae, Tendons in Shoulder Region, Unspecified	1	0	1	0
72690	Enthesopathy of Unspecified Site	1	0	0	1
7279	Unspecified Disorder of Synovium, Tendon, and Bursa	1	0	1	0
7282	Muscular Wasting and Disuse Atrophy, Not Elsewhere Classified	2	0	2	0
7295	Pain In Limb	1	0	0	1
75732	Vascular Hamartomas	3	3	0	0
75733	Congenital Pigmentary Anomalies of Skin	1	1	0	0
75739	Other Specified Congenital Anomalies of Skin	2	2	0	0
7808	Hyperhidrosis	1	1	0	0
7820	Disturbance of Skin Sensation	9	0	0	9
7821	Rash and Other Nonspecific Skin Eruption	41	27	2	12
7822	Localized Superficial Swelling, Mass, Or Lump	2	0	0	2
7823	Edema	1	1	0	0
7824	Jaundice, Unspecified, Not of Newborn	1	1	0	0
7827	Spontaneous Ecchymoses	28	4	21	3
7828	Changes in Skin Texture	1	1	0	0
7829	Other Symptoms Involving Skin and Integumentary Tissues	1	1	0	0
7999	Other Unknown or Unspecified Cause of Morbidity or Mortality	1	1	0	0
80501	Closed Fracture of First Cervical Vertebra	1	0	0	1
8409	Sprain of Unspecified Site of Shoulder and Upper Arm	1	0	0	1

Table I-1-1. (Continued)
**Frequencies of Diagnoses for Participants Reporting "Yes" to Skin Bruising,
 Skin Patches, and Sensitivity**

ICD Code	Description	Total Count	Patches	Bruises	Sensitivity
9089	Late Effect of Unspecified Injury	1	0	1	0
9134	Insect Bite, Nonvenomous of Elbow, Forearm, and Wrist	1	0	0	1
9135	Insect Bite, Nonvenomous of Elbow, Forearm, and Wrist, Infected	1	1	0	0
9160	Abrasion Or Friction Burn of Hip, Thigh, Leg, and Ankle	1	0	0	1
9164	Insect Bite, Nonvenomous, of Hip, Thigh, Leg, and Ankle	1	1	0	0
92310	Contusion of Forearm	1	0	1	0
92400	Contusion of Thigh	1	0	0	1
92420	Contusion of Foot	1	1	0	0
94500	Burn, Unspecified Degree, Unspecified Site of Lower Limb	1	1	0	0
9569	Injury to Unspecified Nerve of Pelvic Girdle and Lower Limb	1	0	0	1
9651	Poisoning By Salicylates	1	1	0	0
9796	Poisoning By Other or Unspecified Viral and Rickettsial Vaccines	1	1	0	0
981	Toxic Effect of Petroleum Products	1	0	0	1
9895	Toxic Effect of Venom	1	1	0	0
9951	Angioneurotic Edema, Not Elsewhere Classified	1	1	0	0
9952	Unspecified Adverse Effect of Drugs, Medicinals, and Biologicals Not Elsewhere Classified	7	1	5	1
9988	Other Specified Complications of Procedures, Not Elsewhere Classified	1	1	0	0

Table I-1-2.
Dependent Variable-Covariate Associations for the Gastrointestinal Assessment

Dependent Variable	Level	Age			Race		
		Born ≥1942	Born <1942	p-Value	Black	Non-Black	p-Value
Hepatitis (Non-A, Non-B, or Non-C)	Yes	(n=950) 2.0%	(n=1,266) 1.4%	0.377	(n=131) 1.5%	(n=2,085) 1.7%	0.999
Jaundice (Unspecified)	Yes	(n=937) 2.0%	(n=1,239) 2.8%	0.296	(n=130) 1.5%	(n=2,046) 2.5%	0.673
Chronic Liver Disease and Cirrhosis (Alcohol-Related)	Yes	(n=954) 4.3%	(n=1,274) 5.7%	0.179	(n=131) 8.4%	(n=2,097) 4.9%	0.114
Chronic Liver Disease and Cirrhosis (Nonalcohol-Related)	Yes	(n=956) 1.7%	(n=1,276) 0.8%	0.082	(n=131) 1.5%	(n=2,101) 1.1%	0.999
Other Liver Disorders	Yes	(n=950) 29.6%	(n=1,268) 28.2%	0.519	(n=131) 47.3%	(n=2,087) 27.6%	<0.001
Hepatomegaly	Yes	(n=955) 1.3%	(n=1,275) 3.0%	0.010	(n=130) 2.3%	(n=2,100) 2.2%	0.999
Current Hepatomegaly	Yes	(n=939) 0.7%	(n=1,257) 0.7%	0.999	(n=124) 0.8%	(n=2,072) 0.7%	0.999
AST (continuous) ^a	High	(n=937) r=-0.001	(n=1,255)	0.964	(n=124) x̄=23.73	(n=2,068) x̄=23.47	0.746
AST (discrete)		2.8%	3.4%	0.459	1.6%	3.2%	0.457
ALT (continuous) ^a	High	(n=937) r=-0.141	(n=1,255)	<0.001	(n=124) x̄=26.10	(n=2,068) x̄=27.54	0.202
ALT (discrete)		7.9%	5.4%	0.025	3.2%	6.7%	0.185
GGT (continuous) ^a	High	(n=937) r=-0.041	(n=1,255)	0.054	(n=124) x̄=37.89	(n=2,068) x̄=32.10	0.005
GGT (discrete)		21.0%	17.6%	0.050	25.0%	18.7%	0.107
Alkaline Phosphatase (continuous) ^a	High	(n=937) r=0.047	(n=1,255)	0.029	(n=124) x̄=70.87	(n=2,068) x̄=69.39	0.379
Alkaline Phosphatase (discrete)		3.7%	4.5%	0.462	5.6%	4.1%	0.531
Total Bilirubin (continuous) ^a	High	(n=937) r=0.035	(n=1,255)	0.104	(n=124) x̄=0.61	(n=2,068) x̄=0.63	0.342
Total Bilirubin (discrete)		4.6%	5.2%	0.595	4.0%	5.0%	0.795
Direct Bilirubin	High	(n=936) 1.7%	(n=1,255) 2.2%	0.560	(n=124) 0.8%	(n=2,067) 2.0%	0.534
LDH (continuous) ^a	High	(n=936) r=0.084	(n=1,254)	<0.001	(n=124) x̄=147.77	(n=2,066) x̄=145.42	0.325
LDH (discrete)		13.0%	15.2%	0.164	21.0%	13.9%	0.040

^a Analysis performed on natural logarithm scale; means transformed from natural logarithm scale.

Note: Correlations (r) are based on total sample and are not category-specific.

Table I-1-2. (Continued)
Dependent Variable-Covariate Associations for the Gastrointestinal Assessment

Dependent Variable	Level	Age			Race		
		Born ≥1942	Born <1942	p-Value	Black	Non-Black	p-Value
Cholesterol (continuous) ^a	High	(n=937)	(n=1,255)		(n=124)	(n=2,068)	
(discrete)		r=0.020		0.343	\bar{x} =216.60	\bar{x} =215.12	0.681
		14.5%	13.9%	0.711	12.1%	14.3%	0.589
HDL Cholesterol (continuous) ^a	Low	(n=923)	(n=1,243)		(n=124)	(n=2,042)	
(discrete)		r=0.034		0.117	\bar{x} =44.80	\bar{x} =40.53	<0.001
		8.8%	10.1%	0.352	4.0%	9.8%	0.047
Cholesterol-HDL Ratio	High	(n=923)	(n=1,243)		(n=124)	(n=2,042)	
(continuous) ^a		r=-0.015		0.490	\bar{x} =4.84	\bar{x} =5.30	0.001
(discrete)		57.5%	57.8%	0.948	46.8%	58.3%	0.015
Triglycerides (continuous) ^a	High	(n=937)	(n=1,255)		(n=124)	(n=2,068)	
(discrete)		r=-0.005		0.818	\bar{x} =115.23	\bar{x} =147.74	<0.001
		8.8%	11.2%	0.076	4.0%	10.5%	0.031
Creatine Kinase (continuous) ^a	High	(n=937)	(n=1,255)		(n=124)	(n=2,068)	
(discrete)		r=-0.093		<0.001	\bar{x} =233.07	\bar{x} =124.27	<0.001
		15.0%	13.1%	0.207	51.6%	11.7%	<0.001
Serum Amylase (continuous) ^a	High	(n=937)	(n=1,255)		(n=124)	(n=2,068)	
(discrete)		r=0.060		0.005	\bar{x} =94.16	\bar{x} =72.35	<0.001
		5.4%	7.7%	0.043	21.8%	5.9%	<0.001
Antibodies for Hepatitis A	Yes	(n=955)	(n=1,277)		(n=131)	(n=2,101)	
		22.8%	42.0%	<0.001	45.0%	33.1%	0.007
Serological Evidence of Prior Hepatitis B Infection	Yes	(n=955)	(n=1,277)		(n=131)	(n=2,101)	
		13.0%	13.8%	0.628	26.7%	12.6%	<0.001
Antibodies for Hepatitis C	Yes	(n=955)	(n=1,277)		(n=131)	(n=2,101)	
		1.7%	1.2%	0.414	3.8%	1.2%	0.039
Stool Hemocult	Yes	(n=880)	(n=1,218)		(n=113)	(n=1,985)	
		2.0%	2.3%	0.810	2.7%	2.2%	0.988
Prealbumin (continuous)	Low	(n=937)	(n=1,255)		(n=124)	(n=2,068)	
(discrete)		r=-0.143		<0.001	\bar{x} =27.57	\bar{x} =27.74	0.687
		0.4%	1.9%	0.004	0.8%	1.3%	0.945
Albumin (continuous)	Low	(n=937)	(n=1,255)		(n=124)	(n=2,068)	
(discrete)		r=-0.161		<0.001	\bar{x} =3,884.4	\bar{x} =3,951.2	0.019
		1.9%	2.6%	0.345	2.4%	2.3%	0.999
α-1 Acid Glycoprotein (continuous) ^a	High	(n=937)	(n=1,255)		(n=124)	(n=2,068)	
(discrete)		r=0.001		0.959	\bar{x} =54.90	\bar{x} =56.57	0.145
		1.8%	3.0%	0.097	1.6%	2.6%	0.718

^a Analysis performed on natural logarithm scale; means transformed from natural logarithm scale.

Note: Correlations (r) are based on total sample and are not category-specific.

Table I-1-2. (Continued)
Dependent Variable-Covariate Associations for the Gastrointestinal Assessment

Dependent Variable	Level	Age			Race		
		Born ≥1942	Born <1942	p-Value	Black	Non-Black	p-Value
α-1 Antitrypsin (continuous) (discrete)		(n=937) r=0.152	(n=1,255)	<0.001	(n=124) x̄=145.81	(n=2,068) x̄=150.66	0.059
	Low	2.0%	1.8%	0.040	0.0%	2.0%	0.097
	Normal	97.3%	96.1%		100.0%	96.4%	
	High	0.7%	2.1%		0.0%	1.6%	
α-2 Macroglobulin (continuous) ^a (discrete)		(n=937) r=0.251	(n=1,255)	<0.001	(n=124) x̄=124.24	(n=2,068) x̄=134.31	<0.001
	High	0.0%	0.8%	0.016	0.8%	0.4%	0.999
Apolipoprotein B (continuous) ^a (discrete)		(n=937) r=0.047	(n=1,255)	0.027	(n=124) x̄=147.26	(n=2,068) x̄=147.70	0.895
	High	70.4%	74.7%	0.028	74.2%	72.8%	0.819
C ₃ Complement (continuous) ^a (discrete)		(n=937) r=0.025	(n=1,255)	0.249	(n=124) x̄=120.23	(n=2,068) x̄=113.92	<0.001
	Low	2.2%	2.6%	0.659	1.6%	2.5%	0.741
C ₄ Complement (continuous) ^a (discrete)		(n=937) r=0.017	(n=1,255)	0.431	(n=124) x̄=25.22	(n=2,068) x̄=21.58	<0.001
	Low	0.6%	0.7%	0.999	0.0%	0.7%	0.696
Haptoglobin (continuous) (discrete)		(n=937) r=0.094	(n=1,255)	<0.001	(n=124) x̄=105.41	(n=2,068) x̄=111.96	0.123
	High	9.7%	14.0%	0.003	10.5%	12.3%	0.650
Transferrin (continuous) ^a (discrete)		(n=937) r=-0.054	(n=1,255)	0.011	(n=124) x̄=282.79	(n=2,068) x̄=293.84	0.003
	Low	10.6%	15.1%	0.002	21.8%	12.7%	0.006

^a Analysis performed on natural logarithm scale; means transferred from natural logarithm scale.

Note: Correlations (r) are based on total sample and are not category-specific.

Table I-1-2. (Continued)
Dependent Variable-Covariate Associations for the Gastrointestinal Assessment

Dependent Variable	Level	Occupation			p-Value
		Officer	Enlisted Flyer	Enlisted Groundcrew	
Hepatitis (Non-A, Non-B, or Non-C)	Yes	(n=858) 1.0%	(n=365) 2.2%	(n=993) 2.0%	0.189
Jaundice (Unspecified)	Yes	(n=841) 3.4%	(n=356) 1.7%	(n=979) 1.9%	0.068
Chronic Liver Disease and Cirrhosis (Alcohol-Related)	Yes	(n=867) 4.4%	(n=364) 5.8%	(n=997) 5.4%	0.480
Chronic Liver Disease and Cirrhosis (Nonalcohol-Related)	Yes	(n=868) 0.9%	(n=365) 1.1%	(n=999) 1.4%	0.623
Other Liver Disorders	Yes	(n=858) 28.1%	(n=365) 26.3%	(n=995) 30.4%	0.288
Hepatomegaly	Yes	(n=867) 2.0%	(n=365) 2.5%	(n=998) 2.4%	0.772
Current Hepatomegaly	Yes	(n=859) 0.7%	(n=360) 0.3%	(n=977) 0.9%	0.467
AST (continuous) ^a (discrete)	High	(n=856) \bar{x} =24.07 3.9%	(n=358) \bar{x} =22.30 2.5%	(n=978) \bar{x} =23.41 2.8%	0.005 0.308
ALT (continuous) ^a (discrete)	High	(n=856) \bar{x} =27.14 6.0%	(n=358) \bar{x} =26.54 5.6%	(n=978) \bar{x} =28.09 7.3%	0.082 0.399
GGT (continuous) ^a (discrete)	High	(n=856) \bar{x} =31.61 17.9%	(n=358) \bar{x} =33.07 19.6%	(n=978) \bar{x} =32.86 19.9%	0.340 0.515
Alkaline Phosphatase (continuous) ^a (discrete)	High	(n=856) \bar{x} =67.06 2.7%	(n=358) \bar{x} =71.22 4.5%	(n=978) \bar{x} =71.01 5.3%	<0.001 0.018
Total Bilirubin (continuous) ^a (discrete)	High	(n=856) \bar{x} =0.64 5.5%	(n=358) \bar{x} =0.60 3.6%	(n=978) \bar{x} =0.62 4.9%	0.006 0.394
Direct Bilirubin	High	(n=856) 2.3%	(n=357) 0.8%	(n=978) 2.0%	0.224
LDH (continuous) ^a (discrete)	High	(n=855) \bar{x} =144.51 13.2%	(n=358) \bar{x} =145.68 15.1%	(n=977) \bar{x} =146.43 14.9%	0.276 0.514

^a Analysis performed on natural logarithm scale; means transformed from natural logarithm scale.

Table I-1-2. (Continued)
Dependent Variable-Covariate Associations for the Gastrointestinal Assessment

Dependent Variable	Level	Occupation			p-Value
		Officer	Enlisted Flyer	Enlisted Groundcrew	
Cholesterol (continuous) ^a (discrete)	High	(n=856) \bar{x} =212.83 11.4%	(n=358) \bar{x} =220.81 16.8%	(n=978) \bar{x} =215.27 15.5%	0.005 0.013
HDL Cholesterol (continuous) ^a (discrete)	Low	(n=844) \bar{x} =42.20 9.1%	(n=351) \bar{x} =40.22 10.0%	(n=971) \bar{x} =39.74 9.7%	<0.001 0.875
Cholesterol-HDL Ratio (continuous) ^a (discrete)	High	(n=844) \bar{x} =5.04 49.9%	(n=351) \bar{x} =5.46 64.4%	(n=971) \bar{x} =5.41 62.0%	<0.001 <0.001
Triglycerides (continuous) ^a (discrete)	High	(n=856) \bar{x} =138.83 9.6%	(n=358) \bar{x} =154.27 12.3%	(n=978) \bar{x} =148.79 9.8%	0.003 0.328
Creatine Kinase (continuous) ^a (discrete)	High	(n=856) \bar{x} =125.94 12.6%	(n=358) \bar{x} =122.79 13.1%	(n=978) \bar{x} =133.60 15.3%	0.014 0.219
Serum Amylase (continuous) ^a (discrete)	High	(n=856) \bar{x} =73.76 8.2%	(n=358) \bar{x} =72.66 3.1%	(n=978) \bar{x} =73.45 6.9%	0.800 0.005
Antibodies for Hepatitis A	Yes	(n=869) 25.4%	(n=364) 45.9%	(n=999) 36.6%	<0.001
Serological Evidence of Prior Hepatitis B Infection	Yes	(n=869) 7.6%	(n=364) 17.9%	(n=999) 16.9%	<0.001
Antibodies for Hepatitis C	Yes	(n=869) 1.2%	(n=364) 1.1%	(n=999) 1.7%	0.523
Stool Hemocult	Yes	(n=830) 2.0%	(n=344) 0.6%	(n=924) 2.9%	0.038
Prealbumin (continuous) (discrete)	Low	(n=856) \bar{x} =27.89 1.6%	(n=358) \bar{x} =27.66 1.1%	(n=978) \bar{x} =27.61 1.0%	0.383 0.485
Albumin (continuous) (discrete)	Low	(n=856) \bar{x} =3,944.4 1.8%	(n=358) \bar{x} =3,932.2 2.8%	(n=978) \bar{x} =3,955.7 2.7%	0.436 0.357
α -1 Acid Glycoprotein (continuous) ^a (discrete)	High	(n=856) \bar{x} =54.45 2.1%	(n=358) \bar{x} =57.79 3.6%	(n=978) \bar{x} =57.81 2.5%	<0.001 0.296

^a Analysis performed on natural logarithm scale; means transformed from natural logarithm scale.

Table I-1-2. (Continued)
Dependent Variable-Covariate Associations for the Gastrointestinal Assessment

Dependent Variable	Level	Occupation			p-Value
		Officer	Enlisted Flyer	Enlisted Groundcrew	
α -1 Antitrypsin (continuous) ^a (discrete)		(n=856) \bar{x} = 146.35	(n=358) \bar{x} = 155.16	(n=978) \bar{x} = 152.16	<0.001
	Low	3.0%	0.8%	1.3%	0.043
	Normal	95.6%	97.5%	97.2%	
	High	1.4%	1.7%	1.5%	
α -2 Macroglobulin (continuous) ^a (discrete)		(n=856) \bar{x} = 132.67	(n=358) \bar{x} = 137.55	(n=978) \bar{x} = 133.26	0.024
	High	0.2%	0.8%	0.5%	0.342
Apolipoprotein B (continuous) ^a (discrete)		(n=856) \bar{x} = 144.37	(n=358) \bar{x} = 154.03	(n=978) \bar{x} = 148.33	<0.001
	High	69.6%	81.0%	72.8%	<0.001
C ₃ Complement (continuous) ^a (discrete)		(n=856) \bar{x} = 111.26	(n=358) \bar{x} = 115.46	(n=978) \bar{x} = 116.52	<0.001
	Low	3.0%	3.1%	1.7%	0.145
C ₄ Complement (continuous) ^a (discrete)		(n=856) \bar{x} = 21.23	(n=358) \bar{x} = 22.01	(n=978) \bar{x} = 22.17	<0.001
	Low	0.7%	1.7%	0.3%	0.027
Haptoglobin (continuous) (discrete)		(n=856) \bar{x} = 103.55	(n=358) \bar{x} = 120.88	(n=978) \bar{x} = 115.22	<0.001
	High	9.3%	17.0%	12.9%	0.001
Transferrin (continuous) ^a (discrete)		(n=856) \bar{x} = 290.40	(n=358) \bar{x} = 294.57	(n=978) \bar{x} = 295.17	0.038
	Low	13.9%	15.1%	11.9%	0.222

^a Analysis performed on natural logarithm scale; means transformed from natural logarithm scale.

Table I-1-2. (Continued)
Dependent Variable-Covariate Associations for the Gastrointestinal Assessment

Dependent Variable	Level	Industrial Chemical Exposure			Degreasing Chemical Exposure		
		No	Yes	p-Value	No	Yes	p-Value
Hepatitis (Non-A, Non-B, or Non-C)	Yes	(n=914) 1.0%	(n=1,302) 2.2%	0.052	(n=820) 1.0%	(n=1,396) 2.1%	0.075
Jaundice (Unspecified)	Yes	(n=894) 2.9%	(n=1,282) 2.2%	0.353	(n=803) 2.1%	(n=1,373) 2.7%	0.488
Chronic Liver Disease and Cirrhosis (Alcohol-Related)	Yes	(n=918) 4.5%	(n=1,310) 5.5%	0.321	(n=822) 4.9%	(n=1,406) 5.2%	0.812
Chronic Liver Disease and Cirrhosis (Nonalcohol-Related)	Yes	(n=922) 1.0%	(n=1,310) 1.3%	0.619	(n=825) 1.1%	(n=1,407) 1.2%	0.964
Other Liver Disorders	Yes	(n=914) 28.4%	(n=1,304) 29.1%	0.788	(n=820) 28.0%	(n=1,398) 29.3%	0.577
Hepatomegaly	Yes	(n=921) 2.2%	(n=1,309) 2.3%	0.965	(n=824) 1.9%	(n=1,406) 2.4%	0.558
Current Hepatomegaly	Yes	(n=910) 0.8%	(n=1,286) 0.7%	0.999	(n=813) 0.4%	(n=1,383) 0.9%	0.208
AST (continuous) ^a (discrete)	High	(n=908) \bar{x} =23.74 3.9%	(n=1,284) \bar{x} =23.30 2.6%	0.244 0.142	(n=811) \bar{x} =23.32 2.7%	(n=1,381) \bar{x} =23.57 3.4%	0.520 0.443
ALT (continuous) ^a (discrete)	High	(n=908) \bar{x} =27.26 6.3%	(n=1,284) \bar{x} =27.60 6.6%	0.526 0.816	(n=811) \bar{x} =26.67 5.4%	(n=1,381) \bar{x} =27.93 7.1%	0.023 0.149
GGT (continuous) ^a (discrete)	High	(n=908) \bar{x} =32.35 19.5%	(n=1,284) \bar{x} =32.44 18.8%	0.927 0.712	(n=811) \bar{x} =31.97 19.5%	(n=1,381) \bar{x} =32.66 18.8%	0.445 0.748
Alkaline Phosphatase (continuous) ^a (discrete)	High	(n=908) \bar{x} =69.13 3.4%	(n=1,284) \bar{x} =69.72 4.7%	0.453 0.178	(n=811) \bar{x} =68.75 3.5%	(n=1,381) \bar{x} =69.90 4.6%	0.148 0.252
Total Bilirubin (continuous) ^a (discrete)	High	(n=908) \bar{x} =0.63 4.4%	(n=1,284) \bar{x} =0.62 5.3%	0.619 0.396	(n=811) \bar{x} =0.63 4.9%	(n=1,381) \bar{x} =0.63 4.9%	0.796 0.999
Direct Bilirubin	High	(n=908) 1.3%	(n=1,283) 2.4%	0.096	(n=811) 2.0%	(n=1,380) 2.0%	0.999
LDH (continuous) ^a (discrete)	High	(n=906) \bar{x} =145.30 14.0%	(n=1,284) \bar{x} =145.74 14.5%	0.690 0.805	(n=811) \bar{x} =144.37 12.8%	(n=1,379) \bar{x} =146.26 15.2%	0.094 0.149

^a Analysis performed on natural logarithm scale; means transformed from natural logarithm scale.

Table I-1-2. (Continued)
Dependent Variable-Covariate Associations for the Gastrointestinal Assessment

Dependent Variable	Level	Industrial Chemical Exposure			Degreasing Chemical Exposure		
		No	Yes	p-Value	No	Yes	p-Value
Cholesterol (continuous) ^a (discrete)	High	(n=908) \bar{x} =214.07 12.0%	(n=1,284) \bar{x} =216.01 15.7%	0.249 0.019	(n=811) \bar{x} =212.88 11.5%	(n=1,381) \bar{x} =216.59 15.7%	0.030 0.007
HDL Cholesterol (continuous) ^a (discrete)	Low	(n=900) \bar{x} =41.33 9.6%	(n=1,266) \bar{x} =40.36 9.5%	0.031 0.999	(n=802) \bar{x} =41.48 10.3%	(n=1,364) \bar{x} =40.34 9.0%	0.014 0.345
Cholesterol-HDL Ratio (continuous) ^a (discrete)	High	(n=900) \bar{x} =5.17 55.0%	(n=1,266) \bar{x} =5.34 59.6%	0.013 0.038	(n=802) \bar{x} =5.12 52.6%	(n=1,346) \bar{x} =5.36 60.6%	<0.001 <0.001
Triglycerides (continuous) ^a (discrete)	High	(n=908) \bar{x} =141.35 9.3%	(n=1,284) \bar{x} =148.81 10.7%	0.035 0.284	(n=811) \bar{x} =140.37 10.0%	(n=1,381) \bar{x} =148.89 10.2%	0.018 0.926
Creatine Kinase (continuous) ^a (discrete)	High	(n=908) \bar{x} =127.74 13.4%	(n=1,284) \bar{x} =129.51 14.3%	0.561 0.630	(n=811) \bar{x} =130.03 13.6%	(n=1,381) \bar{x} =128.03 14.1%	0.520 0.764
Serum Amylase (continuous) ^a (discrete)	High	(n=908) \bar{x} =72.78 6.6%	(n=1,284) \bar{x} =73.91 6.9%	0.318 0.889	(n=811) \bar{x} =74.42 6.8%	(n=1,381) \bar{x} =72.87 6.7%	0.181 0.999
Antibodies for Hepatitis A	Yes	(n=921) 33.2%	(n=1,311) 34.2%	0.674	(n=825) 32.1%	(n=1,407) 34.8%	0.221
Serological Evidence of Prior Hepatitis B Infection	Yes	(n=921) 11.3%	(n=1,311) 15.0%	0.015	(n=825) 10.9%	(n=1,407) 14.9%	0.009
Antibodies for Hepatitis C	Yes	(n=921) 1.1%	(n=1,311) 1.6%	0.400	(n=825) 1.1%	(n=1,407) 1.6%	0.463
Stool Hemoccult	Yes	(n=875) 1.9%	(n=1,223) 2.4%	0.610	(n=778) 2.1%	(n=1,320) 2.3%	0.863
Prealbumin (continuous) (discrete)	Low	(n=908) \bar{x} =27.78 1.4%	(n=1,284) \bar{x} =27.69 1.2%	0.610 0.728	(n=811) \bar{x} =27.87 1.1%	(n=1,381) \bar{x} =27.64 1.4%	0.260 0.735
Albumin (continuous) (discrete)	Low	(n=908) \bar{x} =3,943.8 2.2%	(n=1,284) \bar{x} =3,950.0 2.4%	0.640 0.857	(n=811) \bar{x} =3,956.0 2.0%	(n=1,381) \bar{x} =3,942.4 2.5%	0.318 0.487
α -1 Acid Glycoprotein (continuous) ^a (discrete)	High	(n=908) \bar{x} =55.80 2.3%	(n=1,284) \bar{x} =56.96 2.6%	0.032 0.722	(n=811) \bar{x} =55.46 2.7%	(n=1,381) \bar{x} =57.08 2.4%	0.003 0.745

^a Analysis performed on natural logarithm scale; means transformed from natural logarithm scale.

Table I-1-2. (Continued)
Dependent Variable-Covariate Associations for the Gastrointestinal Assessment

Dependent Variable	Level	Industrial Chemical Exposure			Degreasing Chemical Exposure		
		No	Yes	p-Value	No	Yes	p-Value
α -1 Antitrypsin (continuous) (discrete)		(n=908) \bar{x} =148.41	(n=1,284) \bar{x} =151.78	0.005	(n=811) \bar{x} =147.33	(n=1,381) \bar{x} =152.17	<0.001
	Low	2.4%	1.6%	0.339	2.8%	1.4%	0.051
	Normal	96.2%	96.8%		95.8%	97.0%	
	High	1.4%	1.6%		1.4%	1.6%	
α -2 Macroglobulin (continuous) ^a (discrete)		(n=908) \bar{x} =133.18	(n=1,284) \bar{x} =134.10	0.468	(n=811) \bar{x} =133.09	(n=1,381) \bar{x} =134.09	0.438
	High	0.7%	0.3%	0.382	0.9%	0.2%	0.066
Apolipoprotein B (continuous) ^a (discrete)		(n=908) \bar{x} =146.62	(n=1,284) \bar{x} =148.43	0.249	(n=811) \bar{x} =145.26	(n=1,381) \bar{x} =149.11	0.015
	High	72.6%	73.1%	0.811	72.0%	73.4%	0.503
C ₃ Complement (continuous) ^a (discrete)		(n=908) \bar{x} =112.94	(n=1,284) \bar{x} =115.22	0.002	(n=811) \bar{x} =112.26	(n=1,381) \bar{x} =115.46	<0.001
	Low	2.6%	2.3%	0.752	2.5%	2.5%	0.999
C ₄ Complement (continuous) ^a (discrete)		(n=908) \bar{x} =21.45	(n=1,284) \bar{x} =22.00	0.015	(n=811) \bar{x} =21.67	(n=1,381) \bar{x} =21.83	0.482
	Low	0.7%	0.7%	0.999	0.7%	0.7%	0.999
Haptoglobin (continuous) (discrete)		(n=908) \bar{x} =109.25	(n=1,284) \bar{x} =113.24	0.045	(n=811) \bar{x} =106.92	(n=1,381) \bar{x} =114.32	<0.001
	High	10.9%	13.1%	0.141	9.6%	13.7%	0.006
Transferrin (continuous) ^a (discrete)		(n=908) \bar{x} =291.96	(n=1,284) \bar{x} =294.09	0.237	(n=811) \bar{x} =289.26	(n=1,381) \bar{x} =295.55	0.001
	Low	14.0%	12.6%	0.384	14.7%	12.3%	0.130

^a Analysis performed on natural logarithm scale; means transformed from natural logarithm scale.

Table I-1-2. (Continued)
Dependent Variable-Covariate Associations for the Gastrointestinal Assessment

Dependent Variable	Level	Current Alcohol Use (drinks/day)			p-Value
		0-1	>1-4	>4	
Hepatitis (Non-A, Non-B, or Non-c)		--	--	--	--
Jaundice (Unspecified)		--	--	--	--
Chronic Liver Disease and Cirrhosis (Alcohol-Related)		--	--	--	--
Chronic Liver Disease and Cirrhosis (Nonalcohol-Related)		--	--	--	--
Other Liver Disorders		--	--	--	--
Hepatomegaly		--	--	--	--
Current Hepatomegaly	Yes	(n=1,715) 0.6%	(n=396) 1.0%	(n=57) 1.8%	0.403
AST (continuous) ^a (discrete)	High	(n=1,712) 1.8%	(n=395) r=0.169 6.6%	(n=57) 17.5%	<0.001 <0.001
ALT (continuous) ^a (discrete)	High	(n=1,712) 5.5%	(n=395) r=0.091 9.6%	(n=57) 14.0%	<0.001 0.001
GGT (continuous) ^a (discrete)	High	(n=1,712) 15.4%	(n=395) r=0.268 32.2%	(n=57) 43.9%	<0.001 <0.001
Alkaline Phosphatase (continuous) ^a (discrete)	High	(n=1,712) 4.0%	(n=395) r=0.024 3.8%	(n=57) 7.0%	0.270 0.509
Total Bilirubin (continuous) ^a (discrete)	High	(n=1,712) 4.9%	(n=395) r=0.081 4.3%	(n=57) 12.3%	<0.001 0.033
Direct Bilirubin	High	(n=1,711) 1.9%	(n=395) 1.8%	(n=57) 7.0%	0.022
LDH (continuous) ^a (discrete)	High	(n=1,711) 13.5%	(n=394) r=0.009 14.7%	(n=57) 28.1%	0.685 0.007

^a Analysis performed on natural logarithm scale; means transformed from natural logarithm scale.

--: Covariate not applicable for dependent variable.

Note: Correlations (r) are based on total sample and are not category-specific.

Table I-1-2. (Continued)
Dependent Variable-Covariate Associations for the Gastrointestinal Assessment

Dependent Variable	Level	Current Alcohol Use (drinks/day)			p-Value
		0-1	>1-4	>4	
Cholesterol (continuous) ^a (discrete)	High	(n=1,712) 12.6%	(n=395) r=0.074 21.3%	(n=57) 17.5%	0.001 <0.001
HDL Cholesterol (continuous) ^a (discrete)	Low	(n=1,693) 10.6%	(n=389) r=0.221 6.4%	(n=57) 1.8%	<0.001 0.005
Cholesterol-HDL Ratio (continuous) ^a (discrete)	High	(n=1,693) 60.7%	(n=389) r=-0.147 45.8%	(n=57) 49.1%	<0.001 <0.001
Triglycerides (continuous) ^a (discrete)	High	(n=1,712) 9.8%	(n=395) r=-0.012 11.1%	(n=57) 8.8%	0.592 0.695
Creatine Kinase (continuous) ^a (discrete)	High	(n=1,712) 14.4%	(n=395) r=-0.037 12.4%	(n=57) 10.5%	0.085 0.451
Serum Amylase (continuous) ^a (discrete)	High	(n=1,712) 6.7%	(n=395) r=-0.046 6.6%	(n=57) 10.5%	0.032 0.514
Antibodies for Hepatitis A		--	--	--	--
Serological Evidence of Prior Hepatitis B Infection		--	--	--	--
Antibodies for Hepatitis C		--	--	--	--
Stool Hemocult	Yes	(n=1,643) 2.1%	(n=376) 2.1%	(n=52) 3.8%	0.704
Prealbumin (continuous) (discrete)	Low	(n=1,712) 0.9%	(n=395) r=0.087 2.0%	(n=57) 7.0%	<0.001 <0.001
Albumin (continuous) (discrete)	Low	(n=1,712) 2.3%	(n=395) r=0.024 2.3%	(n=57) 3.5%	0.271 0.843
α-1 Acid Glycoprotein (continuous) ^a (discrete)	High	(n=1,712) 2.1%	(n=395) r=0.075 4.1%	(n=57) 5.3%	<0.001 0.036

^a Analysis performed on natural logarithm scale; means transformed from natural logarithm scale.

--: Covariate not applicable for dependent variable.

Note: Correlations (r) are based on total sample and are not category-specific.

Table I-1-2. (Continued)
Dependent Variable-Covariate Associations for the Gastrointestinal Assessment

Dependent Variable	Level	Current Alcohol Use (drinks/day)			p-Value
		0-1	>1-4	>4	
α -1 Antitrypsin (continuous) (discrete)		(n=1,712)	(n=395) r=0.006	(n=57)	0.791
	Low	1.8%	2.8%	1.8%	0.017
	Normal	97.1%	94.7%	93.0%	
	High	1.1%	2.5%	5.3%	
α -2 Macroglobulin (continuous) ^a (discrete)		(n=1,712)	(n=395) r=-0.032	(n=57)	0.135
	High	0.5%	0.5%	0.0%	0.868
Apolipoprotein B (continuous) ^a (discrete)		(n=1,712)	(n=395) r=0.030	(n=57)	0.166
	High	72.1%	75.2%	82.5%	0.118
C ₃ Complement (continuous) ^a (discrete)		(n=1,712)	(n=395) r=-0.051	(n=57)	0.018
	Low	2.5%	2.5%	3.5%	0.880
C ₄ Complement (continuous) ^a (discrete)		(n=1,712)	(n=395) r=0.024	(n=57)	0.258
	Low	0.9%	0.0%	0.0%	0.136
Haptoglobin (continuous) (discrete)		(n=1,712)	(n=395) r=0.058	(n=57)	0.007
	High	11.6%	14.2%	14.0%	0.341
Transferrin (continuous) ^a (discrete)		(n=1,712)	(n=395) r=0.042	(n=57)	0.052
	Low	13.7%	11.1%	8.8%	0.240

^a Analysis performed on natural logarithm scale; means transformed from natural logarithm scale.

Note: Correlations (r) are based on total sample and are not category-specific.

Table I-1-2. (Continued)
Dependent Variable-Covariate Associations for the Gastrointestinal Assessment

Dependent Variable	Level	Lifetime Alcohol History (drink-years)			p-Value
		0	>0-40	>40	
Hepatitis (Non-A, Non-B, or Non-C)	Yes	(n=133) 1.5%	(n=1,482) 1.7%	(n=560) 1.8%	0.972
Jaundice (Unspecified)	Yes	(n=132) 3.8%	(n=1,450) 2.6%	(n=552) 2.2%	0.567
Chronic Liver Disease and Cirrhosis (Alcohol-Related)	Yes	(n=134) 0.0%	(n=1,491) 1.7%	(n=560) 15.7%	<0.001
Chronic Liver Disease and Cirrhosis (Nonalcohol-Related)		--	--	--	--
Other Liver Disorders	Yes	(n=133) 27.8%	(n=1,482) 26.9%	(n=562) 34.5%	0.003
Hepatomegaly	Yes	(n=134) 0.7%	(n=1,490) 1.5%	(n=563) 4.8%	<0.001
Current Hepatomegaly	Yes	(n=132) 0.0%	(n=1,468) 0.5%	(n=553) 1.4%	0.040
AST (continuous) ^a		(n=132)	(n=1,465) r=0.066	(n=552)	0.002
(discrete)	High	1.5%	1.9%	6.7%	<0.001
ALT (continuous) ^a		(n=132)	(n=1,465) r=-0.016	(n=552)	0.468
(discrete)	High	7.6%	5.5%	9.1%	0.012
GGT (continuous) ^a		(n=132)	(n=1,465) r=0.085	(n=552)	<0.001
(discrete)	High	13.6%	16.4%	28.4%	<0.001
Alkaline Phosphatase (continuous) ^a		(n=132)	(n=1,465) r=0.015	(n=552)	0.491
(discrete)	High	5.3%	4.0%	4.2%	0.753
Total Bilirubin (continuous) ^a		(n=132)	(n=1,465) r=0.032	(n=552)	0.133
(discrete)	High	1.5%	5.1%	5.8%	0.129
Direct Bilirubin	High	(n=132) 1.5%	(n=1,464) 1.8%	(n=552) 2.5%	0.563
LDH (continuous) ^a		(n=132)	(n=1,464) r=0.003	(n=551)	0.876
(discrete)	High	12.1%	14.5%	13.6%	0.680

^a Analysis performed on natural logarithm scale; means transformed from natural logarithm scale.

--: Covariate not applicable for dependent variable.

Note: Correlations (r) are based on total sample and are not category-specific.

Table I-1-2. (Continued)
Dependent Variable-Covariate Associations for the Gastrointestinal Assessment

Dependent Variable	Level	Lifetime Alcohol History (drink/years)			p-Value
		0	>0-40	>40	
Cholesterol (continuous) ^a (discrete)	High	(n=132) 11.4%	(n=1,465) r=0.018 13.3%	(n=552) 17.2%	0.400 0.052
HDL Cholesterol (continuous) ^a (discrete)	Low	(n=131) 19.1%	(n=1,450) r=0.102 9.4%	(n=543) 7.7%	<0.001 <0.001
Cholesterol-HDL Ratio (continuous) ^a (discrete)	High	(n=131) 66.4%	(n=1,450) r=-0.077 58.4%	(n=543) 53.6%	<0.001 0.017
Triglycerides (continuous) ^a (discrete)	High	(n=132) 13.6%	(n=1,465) r=0.007 9.4%	(n=552) 11.2%	0.735 0.174
Creatine Kinase (continuous) ^a (discrete)	High	(n=132) 17.4%	(n=1,465) r=-0.057 14.2%	(n=552) 12.3%	0.008 0.269
Serum Amylase (continuous) ^a (discrete)	High	(n=132) 4.5%	(n=1,465) r=-0.006 7.1%	(n=552) 6.5%	0.792 0.513
Antibodies for Hepatitis A	Yes	(n=134) 41.0%	(n=1,491) 32.1%	(n=564) 35.8%	0.046
Serological Evidence of Prior Hepatitis B Infection	Yes	(n=134) 11.2%	(n=1,491) 12.4%	(n=564) 16.7%	0.030
Antibodies for Hepatitis C	Yes	(n=134) 1.5%	(n=1,491) 1.2%	(n=564) 2.0%	0.444
Stool Hemocult	Yes	(n=124) 2.4%	(n=1,412) 1.9%	(n=521) 2.9%	0.428
Prealbumin (continuous) (discrete)	Low	(n=132) 0.0%	(n=1,465) r=-0.010 0.9%	(n=552) 2.5%	0.629 0.005
Albumin (continuous) (discrete)	Low	(n=132) 1.5%	(n=1,465) r=-0.010 2.4%	(n=552) 2.5%	0.650 0.785
α-1 Acid Glycoprotein (continuous) ^a (discrete)	High	(n=132) 1.5%	(n=1,465) r=0.082 2.1%	(n=552) 4.0%	<0.001 0.044

^a Analysis performed on natural logarithm scale; means transformed from natural logarithm scale.

Note: Correlations (r) are based on total sample and are not category-specific.

Table I-1-2. (Continued)
Dependent Variable-Covariate Associations for the Gastrointestinal Assessment

Dependent Variable	Level	Lifetime Alcohol History (drink/years)			p-Value
		0	>0-40	>40	
α -1 Antitrypsin (continuous) (discrete)		(n=132)	(n=1,465) r=0.099	(n=552)	<0.001
	Low	1.5%	1.9%	2.0%	0.011
	Normal	97.7%	97.1%	94.9%	
	High	0.8%	1.0%	3.1%	
α -2 Macroglobulin (continuous) ^a (discrete)		(n=132)	(n=1,465) r=0.061	(n=552)	0.004
	High	0.8%	0.4%	0.5%	0.813
Apolipoprotein B (continuous) ^a (discrete)		(n=132)	(n=1,465) r=0.008	(n=552)	0.696
	High	72.0%	72.6%	73.7%	0.859
C ₃ Complement (continuous) ^a (discrete)		(n=132)	(n=1,465) r=-0.002	(n=552)	0.925
	Low	0.8%	2.7%	2.5%	0.408
C ₄ Complement (continuous) ^a (discrete)		(n=132)	(n=1,465) r=0.039	(n=552)	0.068
	Low	0.8%	0.8%	0.4%	0.545
Haptoglobin (continuous) (discrete)		(n=132)	(n=1,465) r=0.089	(n=552)	<0.001
	High	13.6%	10.9%	14.9%	0.046
Transferrin (continuous) ^a (discrete)		(n=132)	(n=1,465) r=0.004	(n=552)	0.864
	Low	15.2%	12.4%	14.7%	0.301

^a Analysis performed on natural logarithm scale; means transformed from natural logarithm scale.

Note: Correlations (r) are based on total sample and are not category-specific.

Table I-1-2. (Continued)
Dependent Variable-Covariate Associations for the Gastrointestinal Assessment

Dependent Variable	Level	Lifetime Wine History			Current Wine Use		
		0 Drinks/Day	>0 Drinks/Day	p-Value	0 Drink-Years	>0 Drink-Years	p-Value
Alkaline Phosphatase (continuous) ^a		(n=669)	(n=1,483)		(n=951)	(n=1,212)	
		r=-0.044			r=-0.060		
(discrete)	Yes	5.4%	3.5%	0.055	5.6%	2.9%	0.005
α-1 Antitrypsin (continuous)					(n=951)	(n=1,212)	
					r=-0.084		
(discrete)	Low	--	--	--	1.4%	2.4%	<0.001
	Normal	--	--	--	96.2%	96.9%	0.001
	High	--	--	--	2.4%	0.7%	

^a Analysis performed on natural logarithm scale; means transformed from natural logarithm scale.

--: Covariate not applicable for dependent variable.

Note: Correlations (r) are based on total sample and are not category-specific.

APPENDIX I-2.

Interaction Tables for the Gastrointestinal Assessment

This appendix contains exposure analyses results of interactions between covariates and group or dioxin. Results are presented for separate strata of the covariate and include sample sizes, percent abnormal, relative risks, confidence intervals, and p-values for discrete dependent variables. Sample sizes, adjusted means, differences of adjusted means and confidence intervals or adjusted slopes and standard errors, and p-values are given for continuous dependent variables. Means are transformed back to the original scale, if necessary. Chapter 7, Statistical Methods, provides further details on the analytical approaches used in the interaction analyses. The covariate involved in the interaction and a reference to the analysis table in Chapter 13, Gastrointestinal Assessment, are given in the heading of each subtable. A summary of the interactions described in this appendix follows.

Appendix I-2 Table	Chapter 13 Table	Dependent Variable	Model	Covariate
I-2-1	13-3	Jaundice	1	Race
I-2-2	13-6	Chronic Liver Disease and Cirrhosis	2 3	Race Race
I-2-3	13-9	Other Liver Disorders	2 3 4 5 6	Occupation Degreasing Chemical Exposure Occupation, Degreasing Chemical Exposure Occupation, Degreasing Chemical Exposure Occupation, Degreasing Chemical Exposure
I-2-4	13-12	AST (Continuous)	2 4 5 6	Current Alcohol Use Current Alcohol Use Current Alcohol Use Current Alcohol Use
I-2-5	13-13	AST (Discrete)	1 2 3 4 5 6	Current Alcohol Use Current Alcohol Use Current Alcohol Use Current Alcohol Use Current Alcohol Use Current Alcohol Use
I-2-6	13-15	ALT (Discrete)	1 3	Age, Degreasing Chemical Exposure Degreasing Chemical Exposure, Current Alcohol Use
I-2-7	13-16	GGT (Continuous)	2 3 4 5 6	Degreasing Chemical Exposure Degreasing Chemical Exposure Occupation Occupation Occupation

Appendix I-2 Table	Chapter 13 Table	Dependent Variable	Model	Covariate
I-2-8	13-17	GGT (Discrete)	3 4 5 6	Degreasing Chemical Exposure Degreasing Chemical Exposure Degreasing Chemical Exposure Degreasing Chemical Exposure
I-2-9	13-18	Alkaline Phosphatase (Continuous)	1 2 3 4 5 6	Degreasing Chemical Exposure, Age, Race Degreasing Chemical Exposure Degreasing Chemical Exposure Race Race Race
I-2-10	13-19	Alkaline Phosphatase (Discrete)	2	Degreasing Chemical Exposure
I-2-11	13-20	Total Bilirubin (Continuous)	4	Degreasing Chemical Exposure
I-2-12	13-21	Total Bilirubin (Discrete)	2 4 5 6	Industrial Chemical Exposure Degreasing Chemical Exposure Degreasing Chemical Exposure Degreasing Chemical Exposure
I-2-13	13-22	Direct Bilirubin (Discrete)	4 5 6	Lifetime Alcohol History Lifetime Alcohol History Lifetime Alcohol History
I-2-14	13-23	Lactic Dehydrogenase (LDH) (Continuous)	1 3	Age, Lifetime Alcohol History Age, Race Lifetime Alcohol History
I-2-15	13-24	Lactic Dehydrogenase (LDH) (Discrete)	1 3	Current Alcohol Use Lifetime Alcohol History
I-2-16	13-25	Cholesterol (Continuous)	1 2 3	Current Alcohol Use Degreasing Chemical Exposure Lifetime Alcohol History
I-2-17	13-26	Cholesterol (Discrete)	1 2 3 5	Current Alcohol Use Degreasing Chemical Exposure Lifetime Alcohol History Current Alcohol Use Occupation
I-2-18	13-27	HDL Cholesterol (Continuous)	1 3 4 5 6	Current Alcohol Use, Lifetime Alcohol History Current Alcohol Use, Lifetime Alcohol History Current Alcohol Use, Lifetime Alcohol History Current Alcohol Use, Lifetime Alcohol History Current Alcohol Use, Lifetime Alcohol History, Degreasing Chemical Exposure

Appendix I-2 Table	Chapter 13 Table	Dependent Variable	Model	Covariate
I-2-19	13-28	HDL Cholesterol (Discrete)	3 4 5 6	Lifetime Alcohol History Lifetime Alcohol History Lifetime Alcohol History Lifetime Alcohol History
I-2-20	13-29	Cholesterol-HDL Ratio (Continuous)	2 3 4 5 6	Current Alcohol Use Current Alcohol Use Degreasing Chemical Exposure Age Degreasing Chemical Exposure
I-2-21	13-31	Triglycerides (Continuous)	2 4 6	Occupation Occupation Occupation and Lifetime Alcohol History
I-2-22	13-33	Creatine Kinase (Continuous)	1 3	Race Lifetime Alcohol History
I-2-23	13-34	Creatine Kinase (Discrete)	1 3	Race Race, Lifetime Alcohol History
I-2-24	13-36	Serum Amylase (Discrete)	2 3	Age Race
I-2-25	13-38	Serological Evidence of Prior Hepatitis B Infection	3 4 5 6	Age, Occupation Occupation Occupation Occupation
I-2-26	13-39	Antibodies for Hepatitis C	1	Age, Degreasing Chemical Exposure
I-2-27	13-40	Stool Hemocult	1	Lifetime Alcohol History
I-2-28	13-41	Prealbumin (Continuous)	1 2 3 4 5 6	Current Alcohol Use Industrial Chemical Exposure Industrial Chemical Exposure Industrial Chemical Exposure, Degreasing Chemical Exposure Occupation, Degreasing Chemical Exposure Industrial Chemical Exposure, Degreasing Chemical Exposure
I-2-29	13-42	Prealbumin (Discrete)	4 5 6	Occupation Occupation Age
I-2-30	13-43	Albumin (Continuous)	1 2 3 4 5 6	Age, Lifetime Alcohol History Industrial Chemical Exposure Industrial Chemical Exposure Current Alcohol Use, Degreasing Chemical Exposure Current Alcohol Use, Degreasing Chemical Exposure Current Alcohol Use, Degreasing Chemical Exposure

Appendix I-2 Table	Chapter 13 Table	Dependent Variable	Model	Covariate
I-2-31	13-44	Albumin (Discrete)	1	Industrial Chemical Exposure
I-2-32	13-45	α -1 Acid Glycoprotein (Continuous)	2	Occupation, Lifetime Alcohol History
			3	Lifetime Alcohol History
			4	Lifetime Alcohol History
I-2-33	13-46	α -1 Acid Glycoprotein (Discrete)	1	Age
			2	Occupation, Degreasing Chemical Exposure
			3	Age
			4	Occupation
			5	Occupation
			6	Occupation
I-2-34	13-47	α -1 Antitrypsin (Continuous)	2	Industrial Chemical Exposure
			3	Degreasing Chemical Exposure
			4	Occupation, Degreasing Chemical Exposure
			5	Occupation, Degreasing Chemical Exposure
			6	Occupation, Degreasing Chemical Exposure
			6	Occupation, Degreasing Chemical Exposure
I-2-35	13-49	α -2 Macroglobulin (Continuous)	2	Age
I-2-36	13-51	Apolipoprotein B (Continuous)	2	Age
			5	Age
I-2-37	13-52	Apolipoprotein B (Discrete)	2	Age
			5	Age
I-2-38	13-53	C ₃ Complement	5	Occupation
I-2-39	13-54	C ₃ Complement (Discrete)	1	Race
			3	Race, Industrial Chemical Exposure
			4	Current Alcohol Use
I-2-40	13-55	C ₄ Complement (Continuous)	2	Age, Occupation
			5	Occupation
I-2-41	13-57	Haptoglobin (Continuous)	2	Age, Lifetime Alcohol History
I-2-42	13-58	Haptoglobulin (Discrete)	2	Occupation, Lifetime Alcohol History
I-2-43	13-59	Transferrin (Continuous)	2	Occupation, Industrial Chemical Exposure
I-2-44	13-60	Transferrin (Discrete)	1	Lifetime Alcohol History
			3	Lifetime Alcohol History

**Table I-2-1.
Interaction Table for Jaundice**

a) MODEL 1: RANCH HANDS VS. COMPARISONS — ADJUSTED (Group-by-Race: Table 13-4)						
Stratum	Occupational Category	Group	n	Percent Yes	Adj. Relative Risk (95% C.I.)	p-Value
<i>Non-Black</i>	<i>All</i>	<i>Ranch Hand</i>	<i>872</i>	<i>1.7</i>	<i>0.55 (0.30,1.00)</i>	<i>0.052</i>
		<i>Comparison</i>	<i>1,174</i>	<i>3.2</i>		
<i>Black</i>	<i>All</i>	<i>Ranch Hand</i>	<i>56</i>	<i>3.6</i>	<i>--</i>	<i>--</i>
		<i>Comparison</i>	<i>74</i>	<i>0.0</i>		
Non-Black	Officer	Ranch Hand	348	2.6	0.61 (0.27,1.36)	0.228
		Comparison	480	4.2		
	Enlisted Flyer	Ranch Hand	150	2.0	1.91 (0.33,11.18)	0.473
		Comparison	181	1.1		
	Enlisted Groundcrew	Ranch Hand	374	0.8	0.27 (0.08,0.88)	0.029
		Comparison	513	2.9		
Black	Officer	Ranch Hand	7	0.0	--	--
		Comparison	6	0.0		
	Enlisted Flyer	Ranch Hand	10	10.0	--	--
		Comparison	15	0.0		
	Enlisted Groundcrew	Ranch Hand	39	2.6	--	--
		Comparison	53	0.0		

--: Adjusted relative risk, confidence interval, and p-value not presented due to the sparse number of abnormalities.

Table I-2-2.
Interaction Table for Chronic Liver Disease and Cirrhosis (Alcohol-Related)

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Race: Table 13-6)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log_e (Initial Dioxin)	
Stratum	Initial Dioxin	n	Percent Yes	Adjusted Relative Risk (95% C.I.)^a	p-Value
Non-Black	Low	145	4.1	1.13 (0.82,1.55)	0.470
	Medium	146	5.5		
	High	144	6.9		
Black	Low	16	25.0	0.14 (0.02,0.95)	0.044
	Medium	9	0.0		
	High	7	0.0		

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Race: Table 13-6)					
Stratum	Dioxin Category	n	Percent Yes	Adjusted Relative Risk (95% C.I.)^b	p-Value
Non-Black	Comparison	938	5.8		
	Background RH	334	5.7	1.09 (0.60,1.97)	0.787
	Low RH	218	4.6	0.71 (0.34,1.50)	0.369
	High RH	217	6.5	0.98 (0.50,1.90)	0.951
	Low plus High RH	435	5.5	0.85 (0.50,1.44)	0.548
Black	Comparison	49	12.2		
	Background RH	13	0.0	--	--
	Low RH	21	19.0	1.58 (0.36,6.95)	0.544
	High RH	11	0.0	--	--
	Low plus High RH	32	12.5	0.76 (0.18,3.29)	0.713

^a Relative risk for a twofold increase in initial dioxin.

^b Relative risk and confidence interval relative to Comparisons.

--: Adjusted relative risk, confidence interval, and p-value not presented due to the sparse number of abnormalities.

Note: Model 2: Low = 39-98 ppt; Medium = >98-232 ppt; High = >232 ppt.

Model 3: RH = Ranch Hand.

Comparison: Current Dioxin ≤10 ppt.

Background (Ranch Hand): Current Dioxin ≤10 ppt.

Low (Ranch Hand): Current Dioxin >10 ppt, 10 ppt < Initial Dioxin ≤143 ppt.

High (Ranch Hand): Current Dioxin >10 ppt, Initial Dioxin >143 ppt.

Table I-2-3.
Interaction Table for Other Liver Disorders

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Occupation: Table 13-9)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log₂ (Initial Dioxin)	
Stratum	Initial Dioxin	n	Percent Yes	Adjusted Relative Risk (95% C.I.)^a	p-Value
Officer	Low	76	31.6	1.56 (0.78,3.10)	0.207
	Medium	34	41.2		
	High	1	100.0		
Enlisted Flyer	Low	36	11.1	1.98 (1.28,3.07)	0.002
	Medium	43	25.6		
	High	31	45.2		
Enlisted Groundcrew	Low	61	29.5	1.05 (0.87,1.26)	0.609
	Medium	96	32.3		
	High	141	33.3		

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Degreasing Chemical Exposure: Table 13-9)					
Stratum	Dioxin Category	n	Percent Yes	Adjusted Relative Risk (95% C.I.)^b	p-Value
No	Comparison	367	25.6		
	Background RH	180	21.7	0.82 (0.53,1.27)	0.373
	Low RH	94	27.7	1.04 (0.62,1.75)	0.877
	High RH	51	45.1	2.73 (1.47,5.09)	0.002
	Low plus High RH	145	33.8	1.48 (0.97,2.26)	0.070
Yes	Comparison	669	28.6		
	Background RH	185	28.6	1.09 (0.75,1.58)	0.639
	Low RH	159	29.6	1.02 (0.69,1.51)	0.923
	High RH	202	32.2	1.14 (0.80,1.63)	0.456
	Low plus High RH	361	30.9	1.08 (0.81,1.43)	0.605

Table I-2-3. (Continued)
Interaction Table for Other Liver Disorders

c) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Occupation: Table 13-9)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent Yes	Adjusted Relative Risk (95% C.I.) ^c	p-Value
Officer	Low	189	25.4	1.29 (0.96,1.75)	0.096
	Medium	138	33.3		
	High	14	28.6		
Enlisted Flyer	Low	30	6.7	2.04 (1.38,3.00)	<0.001
	Medium	56	17.9		
	High	60	35.0		
Enlisted Groundcrew	Low	71	26.8	1.07 (0.93,1.23)	0.324
	Medium	97	32.0		
	High	216	33.3		

d) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Degreasing Chemical Exposure: Table 13-9)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent Yes	Adjusted Relative Risk (95% C.I.) ^c	p-Value
No	Low	153	20.3	1.49 (1.22,1.82)	<0.001
	Medium	109	28.4		
	High	63	41.3		
Yes	Low	137	27.7	1.09 (0.95,1.24)	0.226
	Medium	182	30.8		
	High	227	31.3		

e) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Occupation: Table 13-9)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent Yes	Adjusted Relative Risk (95% C.I.) ^c	p-Value
Officer	Low	188	24.5	1.28 (1.01,1.62)	0.039
	Medium	133	32.3		
	High	20	45.0		
Enlisted Flyer	Low	32	12.5	1.84 (1.32,2.57)	<0.001
	Medium	55	14.5		
	High	59	35.6		
Enlisted Groundcrew	Low	74	28.4	1.07 (0.94,1.21)	0.301
	Medium	101	32.7		
	High	209	32.5		

Table I-2-3. (Continued)
Interaction Table for Other Liver Disorders

f) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Degreasing Chemical Exposure: Table 13-9)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent Yes	Adjusted Relative Risk (95% C.I.) ^c	p-Value
No	Low	147	19.7	1.42 (1.19,1.69)	<0.001
	Medium	114	28.1		
	High	64	42.2		
Yes	Low	147	28.6	1.09 (0.97,1.22)	0.161
	Medium	175	29.7		
	High	224	31.7		

g) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Occupation: Table 13-9)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent Yes	Adjusted Relative Risk (95% C.I.) ^c	p-Value
Officer	Low	188	24.5	1.23 (0.97,1.56)	0.094
	Medium	133	32.3		
	High	20	45.0		
Enlisted Flyer	Low	31	12.9	1.77 (1.26,2.48)	0.001
	Medium	55	14.5		
	High	59	35.6		
Enlisted Grouncrew	Low	74	28.4	1.05 (0.93,1.19)	0.458
	Medium	101	32.7		
	High	209	32.5		

Table I-2-3. (Continued)
Interaction Table for Other Liver Disorders

h) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Degreasing Chemical Exposure: Table 13-9)					
Current Dioxin Category Summary Statistics				Analysis Results for Log _e (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent Yes	Adjusted Relative Risk (95% C.I.) ^c	p-Value
No	Low	147	19.7	1.37 (1.15,1.64)	0.001
	Medium	114	28.1		
	High	64	42.2		
Yes	Low	146	28.8	1.05 (0.93,1.19)	0.427
	Medium	175	29.7		
	High	224	31.7		

^a Relative risk for a twofold increase in initial dioxin.

^b Relative risk and confidence interval relative to Comparisons.

^c Relative risk for a twofold increase in current dioxin.

Note: Model 2: Low = 39-98 ppt; Medium = >98-232 ppt; High = >232 ppt.

Model 3: RH = Ranch Hand.

Comparison: Current Dioxin ≤10 ppt.

Background (Ranch Hand): Current Dioxin ≤10 ppt.

Low (Ranch Hand): Current Dioxin >10 ppt, 10 ppt < Initial Dioxin ≤143 ppt.

High (Ranch Hand): Current Dioxin >10 ppt, Initial Dioxin >143 ppt.

Model 4: Low = ≤8.1 ppt; Medium = >8.1-20.5 ppt; High = >20.5 ppt.

Models 5 and 6: Low = ≤46 ppq; Medium = >46-128 ppq; High = >128 ppq.

Table I-2-4.
Interaction Table for AST (U/L)
(Continuous)

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Current Alcohol Use: Table 13-12)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log_e (Initial Dioxin)	
Stratum	Initial Dioxin	n	Adjusted Mean^a	Adjusted Slope (Std. Error)^b	p-Value
0-1 Drinks/Day	Low	129	21.64	-0.0025 (0.0151)	0.866
	Medium	134	22.60		
	High	139	21.78		
>1-4 Drinks/Day	Low	40	22.76	0.0725 (0.0302)	0.017
	Medium	29	25.40		
	High	29	27.79		
>4 Drinks/Day	Low	2	21.10	0.2692 (0.1078)	0.013
	Medium	4	32.87		
	High	2	57.11		

b) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Current Alcohol Use: Table 13-12)					
Current Dioxin Category Summary Statistics				Analysis Results for Log_e (Initial Dioxin)	
Stratum	Current Dioxin	n	Adjusted Mean^a	Adjusted Slope (Std. Error)^b	p-Value
0-1 Drinks/Day	Low	224	21.56	0.0072 (0.0102)	0.481
	Medium	217	22.27		
	High	236	21.78		
>1-4 Drinks/Day	Low	56	23.40	0.0332 (0.0216)	0.125
	Medium	70	26.31		
	High	45	24.22		
>4 Drinks/Day	Low	7	20.06	0.2009 (0.0642)	0.002
	Medium	3	20.51		
	High	6	35.94		

RESERVED

Table I-2-5.
Interaction Table for AST
(Discrete)

a) MODEL 1: RANCH HANDS VS. COMPARISONS — ADJUSTED (Group-by-Current Alcohol Use: Table 13-13)						
Stratum	Occupational Category	Group	n	Percent High	Adj. Relative Risk (95% C.I.)	p-Value
0-1 Drinks/Day	All	Ranch Hand	719	1.1	0.46 (0.20,1.03)	0.059
		Comparison	980	2.4		
> 1-4 Drinks/Day	All	Ranch Hand	181	7.7	1.41 (0.63,3.15)	0.398
		Comparison	213	5.6		
> 4 Drinks/Day	All	Ranch Hand	17	17.7	0.97 (0.21,4.43)	0.971
		Comparison	39	18.0		
0-1 Drinks/Day	Officer	Ranch Hand	251	1.2	0.48 (0.17,1.35)	0.166
		Comparison	366	3.0		
	Enlisted Flyer	Ranch Hand	126	0.0	0.22 (0.04,1.24)	0.085
		Comparison	149	3.4		
	Enlisted Groundcrew	Ranch Hand	342	1.5	0.55 (0.21,1.47)	0.234
		Comparison	465	1.5		
> 1-4 Drinks/Day	Officer	Ranch Hand	99	10.1	1.45 (0.58,3.63)	0.422
		Comparison	109	3.7		
	Enlisted Flyer	Ranch Hand	25	4.0	0.65 (0.11,3.76)	0.628
		Comparison	35	2.9		
	Enlisted Groundcrew	Ranch Hand	57	5.3	1.65 (0.56,4.92)	0.366
		Comparison	69	10.1		
> 4 Drinks/Day	Officer	Ranch Hand	7	0.0	1.02 (0.19,5.36)	0.982
		Comparison	12	33.3		
	Enlisted Flyer	Ranch Hand	5	20.0	0.45 (0.06,3.63)	0.456
		Comparison	11	9.1		
	Enlisted Groundcrew	Ranch Hand	5	40.0	1.16 (0.21,6.31)	0.865
		Comparison	16	12.5		

Table I-2-5. (Continued)
Interaction Table for AST
(Discrete)

b) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Current Alcohol Use: Table 13-13)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log₂ (Initial Dioxin)	
Stratum	Initial Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.)^a	p-Value
0-1 Drinks/Day	Low	129	0.8	0.40 (0.10,1.51)	0.174
	Medium	132	1.5		
	High	136	0.0		
>1 Drinks/Day	Low	41	7.3	1.06 (0.65,1.73)	0.829
	Medium	33	9.1		
	High	31	16.1		

c) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Current Alcohol Use: Table 13-13)					
Stratum	Dioxin Category	n	Percent High	Adjusted Relative Risk (95% C.I.)^b	p-Value
0-1 Drinks/Day	Comparison	814	2.1		
	Background RH	280	1.4	0.84 (0.28,2.56)	0.759
	Low RH	192	1.6	0.69 (0.19,2.43)	0.560
	High RH	205	0.0	--	--
	Low plus High RH	397	0.8	0.30 (0.08,1.04)	0.058
>1 Drinks/Day	Comparison	211	6.6		
	Background RH	82	4.9	0.86 (0.27,2.75)	0.801
	Low RH	59	10.2	1.77 (0.63,4.95)	0.276
	High RH	46	10.9	1.24 (0.39,3.92)	0.708
	Low plus High RH	105	10.5	1.52 (0.65,3.56)	0.339

d) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Current Alcohol Use: Table 13-13)					
Current Dioxin Category Summary Statistics				Analysis Results for Log₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.)^c	p-Value
0-1 Drinks/Day	Low	224	0.9	0.83 (0.47,1.45)	0.513
	Medium	217	2.3		
	High	236	0.0		
>1 Drinks/Day	Low	63	3.2	1.43 (0.91,2.24)	0.121
	Medium	73	11.0		
	High	51	9.8		

Table I-2-5. (Continued)
Interaction Table for AST
(Discrete)

e) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Current Alcohol Use: Table 13-13)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.) ^c	p-Value
0-1 Drinks/Day	Low	227	0.9	0.94 (0.60,1.47)	0.781
	Medium	219	1.4		
	High	231	0.9		
>1 Drinks/Day	Low	63	3.2	1.42 (0.93,2.14)	0.101
	Medium	71	9.9		
	High	53	11.3		

f) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Current Alcohol Use: Table 13-13)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.) ^c	p-Value
0-1 Drinks/Day	Low	226	0.9	0.87 (0.55,1.38)	0.562
	Medium	219	1.4		
	High	231	0.9		
>1 Drinks/Day	Low	63	3.2	1.32 (0.86, 2.04)	0.206
	Medium	71	9.9		
	High	53	11.3		

^a Relative risk for a twofold increase in initial dioxin.

^b Relative risk and confidence interval relative to Comparisons.

^c Relative risk for a twofold increase in current dioxin.

--: Adjusted relative risk, confidence interval, and p-value not presented due to the sparse number of abnormalities.

Note: Model 2: Low = 39-98 ppt; Medium = >98-232 ppt; High = >232 ppt.

Model 3: RH = Ranch Hand.

Comparison: Current Dioxin ≤10 ppt.

Background (Ranch Hand): Current Dioxin ≤10 ppt.

Low (Ranch Hand): Current Dioxin >10 ppt, 10 ppt < Initial Dioxin ≤143 ppt.

High (Ranch Hand): Current Dioxin >10 ppt, Initial Dioxin >143 ppt.

Model 4: Low = ≤8.1 ppt; Medium = >8.1-20.5 ppt; High = >20.5 ppt.

Models 5 and 6: Low = ≤46 ppq; Medium = >46-128 ppq; High = >128 ppq.

Table I-2-6.
Interaction Table for ALT
(Discrete)

a) MODEL 1: RANCH HANDS VS. COMPARISONS — ADJUSTED (Group-by-Age: Table 13-15)						
Stratum	Occupational Category	Group	n	Percent High	Adj. Relative Risk (95% C.I.)	p-Value
<i>Born ≥ 1942</i>	<i>All</i>	<i>Ranch Hand</i>	<i>386</i>	<i>5.2</i>	<i>0.50 (0.29,0.85)</i>	<i>0.011</i>
		<i>Comparison</i>	<i>542</i>	<i>10.0</i>		
<i>Born < 1942</i>	<i>All</i>	<i>Ranch Hand</i>	<i>543</i>	<i>5.7</i>	<i>1.16 (0.70,1.91)</i>	<i>0.561</i>
		<i>Comparison</i>	<i>693</i>	<i>5.1</i>		
Born ≥ 1942	Officer	Ranch Hand	78	5.1	0.53 (0.23,1.23)	0.141
		Comparison	121	5.8		
	Enlisted Flyer	Ranch Hand	38	2.6	0.38 (0.12,1.15)	0.088
		Comparison	57	10.5		
	Enlisted Groundcrew	Ranch Hand	270	5.6	0.51 (0.28,0.91)	0.022
		Comparison	364	11.3		
Born < 1942	Officer	Ranch Hand	283	6.0	1.26 (0.68,2.34)	0.469
		Comparison	367	6.0		
	Enlisted Flyer	Ranch Hand	121	5.0	0.90 (0.34,2.40)	0.830
		Comparison	139	5.0		
	Enlisted Groundcrew	Ranch Hand	139	5.8	1.20 (0.56,2.57)	0.640
		Comparison	187	3.2		

Table I-2-6. (Continued)
Interaction Table for ALT
(Discrete)

b) MODEL 1: RANCH HANDS VS. COMPARISONS — ADJUSTED (Group-by-Degreasing Chemical Exposure: Table 13-15)						
Stratum	Occupational Category	Group	n	Percent High	Adj. Relative Risk (95% C.I.)	p-Value
No	All	Ranch Hand	342	2.9	0.39 (0.19,0.81)	0.012
		Comparison	461	7.4		
Yes	All	Ranch Hand	587	7.0	1.00 (0.66,1.52)	0.993
		Comparison	774	7.1		
No	Officer	Ranch Hand	233	3.9	0.53 (0.24,1.14)	0.103
		Comparison	276	6.9		
	Enlisted Flyer	Ranch Hand	27	0.0	0.22 (0.06,0.75)	0.015
		Comparison	58	6.9		
	Enlisted Groundcrew	Ranch Hand	82	1.2	0.20 (0.08,0.53)	0.001
		Comparison	127	8.7		
Yes	Officer	Ranch Hand	128	9.4	2.04 (0.99,4.21)	0.054
		Comparison	212	4.7		
	Enlisted Flyer	Ranch Hand	132	5.3	0.84 (0.32,2.20)	0.720
		Comparison	138	6.5		
	Enlisted Groundcrew	Ranch Hand	327	6.7	0.78 (0.46,1.34)	0.374
		Comparison	424	8.5		

c) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Degreasing Chemical Exposure: Table 13-15)					
Stratum	Dioxin Category	n	Percent High	Adjusted Relative Risk (95% C.I.) ^a	p-Value
No	Comparison	366	6.6		
	Background RH	177	0.6	0.09 (0.01,0.70)	0.021
	Low RH	94	4.3	0.67 (0.22,2.02)	0.478
	High RH	51	2.0	0.23 (0.03,1.76)	0.157
	Low plus High RH	145	3.4	0.48 (0.18,1.31)	0.154
Yes	Comparison	661	7.3		
	Background RH	190	7.4	1.26 (0.64,2.49)	0.498
	Low RH	160	5.0	0.72 (0.33,1.58)	0.419
	High RH	203	8.9	1.05 (0.57,1.93)	0.872
	Low plus High RH	363	7.2	0.92 (0.56,1.53)	0.748

Table I-2-6. (Continued)
Interaction Table for ALT
(Discrete)

d) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Current Alcohol Use: Table 13-15)					
Stratum	Dioxin Category	n	Percent High	Adjusted Relative Risk (95% C.I.) ^a	p-Value
0-1 Drinks/Day	Comparison	816	6.4		
	Background RH	284	3.2	0.62 (0.30,1.29)	0.204
	Low RH	194	2.6	0.40 (0.16,1.04)	0.059
	High RH	208	6.3	0.73 (0.38,1.40)	0.344
	Low plus High RH	402	4.5	0.59 (0.34,1.04)	0.069
> 1-4 Drinks/Day	Comparison	176	8.5		
	Background RH	74	8.1	1.24 (0.45,3.41)	0.676
	Low RH	57	10.5	1.50 (0.54,4.15)	0.431
	High RH	41	12.2	1.23 (0.41,3.68)	0.710
	Low plus High RH	98	11.2	1.37 (0.59,3.15)	0.461
> 4 Drinks/Day	Comparison	35	14.3		
	Background RH	9	0.0	--	--
	Low RH	3	33.3	2.64 (0.17,41.07)	0.488
	High RH	5	20.0	1.13 (0.08,15.40)	0.928
	Low plus High RH	8	25.0	1.62 (0.21,12.83)	0.647

^a Relative risk and confidence interval relative to Comparisons.

--: Adjusted relative risk, confidence interval, and p-value not presented due to the sparse number of abnormalities.

Note: Model 3: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table I-2-7.
Interaction Table for GGT (U/L)
(Continuous)

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Degreasing Chemical Exposure: Table 13-16)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log₂ (Initial Dioxin)	
Stratum	Initial Dioxin	n	Adjusted Mean^a	Adjusted Slope (Std. Error)^b	p-Value
No	Low	66	30.74	0.1281 (0.0439)	0.004
	Medium	46	34.53		
	High	31	50.04		
Yes	Low	104	35.37	0.0041 (0.0266)	0.878
	Medium	119	39.57		
	High	136	36.22		

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Degreasing Chemical Exposure: Table 13-16)					
Stratum	Dioxin Category	n	Adjusted Mean^a	Difference of Adjusted Mean vs. Comparison (95% C.I.)^c	p-Value^d
No	Comparison	366	33.93		
	Background RH	176	31.31	-2.62 --	0.146
	Low RH	93	35.02	1.08 --	0.653
	High RH	50	45.59	11.65 --	0.001
	Low plus High RH	143	38.40	4.47 --	0.038
Yes	Comparison	659	34.81		
	Background RH	186	33.99	-0.82 --	0.634
	Low RH	158	38.45	3.64 --	0.062
	High RH	201	36.27	1.46 --	0.398
	Low plus High RH	359	37.21	2.40 --	0.091

Table I-2-7. (Continued)
Interaction Table for GGT (U/L)
(Continuous)

c) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Occupation: Table 13-16)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Initial Dioxin)	
Stratum	Initial Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
Officer	Low	189	29.24	0.1364 (0.0403)	<0.001
	Medium	140	34.70		
	High	14	44.23		
Enlisted Flyer	Low	30	27.57	0.1157 (0.0403)	0.004
	Medium	57	30.15		
	High	61	37.20		
Enlisted Groundcrew	Low	70	30.69	0.0327 (0.0193)	0.094
	Medium	98	33.46		
	High	216	34.57		

d) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Occupation: Table 13-16)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
Officer	Low	188	28.90	0.1195 (0.0291)	<0.001
	Medium	136	33.97		
	High	19	54.57		
Enlisted Flyer	Low	32	27.97	0.1111 (0.0336)	0.001
	Medium	56	30.17		
	High	60	37.18		
Enlisted Groundcrew	Low	72	30.25	0.0341 (0.0169)	0.044
	Medium	103	33.21		
	High	209	34.88		

Table I-2-7. (Continued)
Interaction Table for GGT (U/L)
(Continuous)

e) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Occupation: Table 13-16)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
Officer	Low	188	32.13	0.0860 (0.0297)	0.004
	Medium	136	35.79		
	High	19	51.46		
Enlisted Flyer	Low	31	30.11	0.1026 (0.0365)	0.005
	Medium	56	32.17		
	High	60	38.35		
Enlisted Groundcrew	Low	72	32.78	0.0202 (0.0173)	0.242
	Medium	103	35.17		
	High	209	35.78		

^a Transformed from natural logarithm scale.

^b Slope and standard error based on natural logarithm of GGT versus log₂ dioxin.

^c Difference of means after transformation to original scale; confidence interval on difference of means not presented because analysis was performed on natural logarithm scale.

^d P-value is based on difference of means on natural logarithm scale.

Note: Model 2: Low = 39-98 ppt; Medium = >98-232 ppt; High = >232 ppt.

Model 3: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Model 4: Low = ≤ 8.1 ppt; Medium = > 8.1-20.5 ppt; High = > 20.5 ppt.

Models 5 and 6: Low = ≤ 46 ppq; Medium = > 46-128 ppq; High = > 128 ppq.

Table I-2-8.
Interaction Table for GGT
(Discrete)

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Degreasing Chemical Exposure: Table 13-17)					
Stratum	Dioxin Category	n	Percent High	Adjusted Relative Risk (95% C.I.) ^a	p-Value
No	Comparison	366	17.8		
	Background RH	176	12.5	0.75 (0.44,1.28)	0.292
	Low RH	93	23.7	1.47 (0.83,2.59)	0.185
	High RH	50	38.0	2.97 (1.53,5.75)	0.001
	Low plus High RH	143	28.7	1.92 (1.20,3.07)	0.007
Yes	Comparison	659	18.4		
	Background RH	186	20.4	1.24 (0.81,1.91)	0.327
	Low RH	158	20.3	1.16 (0.73,1.83)	0.534
	High RH	201	19.4	1.01 (0.67,1.54)	0.959
	Low plus High RH	359	19.8	1.07 (0.76,1.51)	0.690

b) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Degreasing Chemical Exposure: Table 13-17)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.) ^b	p-Value
No	Low	149	13.4	1.43 (1.17,1.76)	0.001
	Medium	109	20.2		
	High	61	34.4		
Yes	Low	138	18.1	1.00 (0.86,1.17)	0.965
	Medium	181	19.9		
	High	226	21.2		

c) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Degreasing Chemical Exposure: Table 13-17)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.) ^b	p-Value
No	Low	143	12.6	1.36 (1.14,1.63)	0.001
	Medium	115	19.1		
	High	61	37.7		
Yes	Low	147	18.4	1.04 (0.91,1.18)	0.560
	Medium	175	19.4		
	High	223	21.5		

Table I-2-8. (Continued)
Interaction Table for GGT
(Discrete)

d) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Degreasing Chemical Exposure: Table 13-17)					
Current Dioxin Category Summary Statistics				Analysis Results for Log_e (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.)^b	p-Value
No	Low	143	12.6	1.30 (1.08,1.56)	0.006
	Medium	115	19.1		
	High	61	37.7		
Yes	Low	146	18.5	0.99 (0.86,1.14)	0.855
	Medium	175	19.4		
	High	223	21.5		

^a Relative risk and confidence interval relative to Comparisons.

^b Relative risk for a twofold increase in current dioxin.

Note: Model 3: RH = Ranch Hand.

Comparison: Current Dioxin ≤10 ppt.

Background (Ranch Hand): Current Dioxin ≤10 ppt.

Low (Ranch Hand): Current Dioxin >10 ppt, 10 ppt < Initial Dioxin ≤143 ppt.

High (Ranch Hand): Current Dioxin >10 ppt, Initial Dioxin >143 ppt.

Model 4: Low = ≤8.1 ppt; Medium = >8.1-20.5 ppt; High = >20.5 ppt.

Models 5 and 6: Low = ≤46 ppq; Medium = >46-128 ppq; High = >128 ppq.

Table I-2-9.
Interaction Table for Alkaline Phosphatase (U/L)
(Continuous)

a) MODEL 1: RANCH HANDS VS. COMPARISONS — ADJUSTED (Group-by-Degreasing Chemical Exposure: Table 13-18)						
Stratum	Occupational Category	Group	n	Adjusted Mean ^a	Difference of Adjusted Means (95% C.I.) ^b	p-Value ^c
<i>No</i>	<i>All</i>	<i>Ranch Hand</i>	<i>340</i>	<i>69.55</i>	<i>-0.58 --</i>	<i>0.651</i>
		<i>Comparison</i>	<i>460</i>	<i>70.12</i>		
<i>Yes</i>	<i>All</i>	<i>Ranch Hand</i>	<i>580</i>	<i>71.74</i>	<i>3.84 --</i>	<i>< 0.001</i>
		<i>Comparison</i>	<i>772</i>	<i>67.90</i>		
No	Officer	Ranch Hand	231	65.50	-1.32 --	0.380
		Comparison	276	66.82		
	Enlisted Flyer	Ranch Hand	27	71.93	-0.54 --	0.900
		Comparison	58	72.46		
	Enlisted Groundcrew	Ranch Hand	82	74.46	2.15 --	0.418
		Comparison	126	72.31		
Yes	Officer	Ranch Hand	126	71.48	6.45 --	0.001
		Comparison	211	65.03		
	Enlisted Flyer	Ranch Hand	130	69.96	-0.26 --	0.904
		Comparison	137	70.22		
	Enlisted Groundcrew	Ranch Hand	324	73.90	4.46 --	0.001
		Comparison	424	69.43		

Table I-2-9. (Continued)
Interaction Table for Alkaline Phosphatase (U/L)
(Continuous)

b) MODEL 1: RANCH HANDS VS. COMPARISONS — ADJUSTED (Group-by-Age: Table 13-18)						
Stratum	Occupational Category	Group	n	Adjusted Mean ^a	Difference of Adjusted Means (95% C.I.) ^b	p-Value ^c
Born ≥ 1942	<i>All</i>	<i>Ranch Hand</i>	384	71.31	4.13 --	< 0.001
		<i>Comparison</i>	541	67.18		
Born < 1942	<i>All</i>	<i>Ranch Hand</i>	536	70.93	0.76 --	0.465
		<i>Comparison</i>	691	70.17		
Born ≥ 1942	Officer	Ranch Hand	77	67.12	4.07 --	0.093
		Comparison	121	63.04		
	Enlisted Flyer	Ranch Hand	38	76.53	3.78 --	0.346
		Comparison	56	72.75		
	Enlisted Groundcrew	Ranch Hand	269	72.91	4.23 --	0.004
		Comparison	364	68.69		
Born < 1942	Officer	Ranch Hand	280	68.61	0.60 --	0.664
		Comparison	366	68.00		
	Enlisted Flyer	Ranch Hand	119	69.30	-1.65 --	0.461
		Comparison	139	70.95		
	Enlisted Groundcrew	Ranch Hand	137	74.31	3.26 --	0.119
		Comparison	186	71.06		

Table I-2-9. (Continued)
Interaction Table for Alkaline Phosphatase (U/L)
(Continuous)

c) MODEL 1: RANCH HANDS VS. COMPARISONS — ADJUSTED (Group-by-Race: Table 13-18)						
Stratum	Occupational Category	Group	n	Adjusted Mean ^a	Difference of Adjusted Means (95% C.I.) ^b	p-Value ^c
<i>Black</i>	<i>All</i>	<i>Ranch Hand</i>	<i>51</i>	<i>67.52</i>	<i>-4.20 --</i>	<i>0.201</i>
		<i>Comparison</i>	<i>70</i>	<i>71.72</i>		
<i>Non-Black</i>	<i>All</i>	<i>Ranch Hand</i>	<i>869</i>	<i>71.11</i>	<i>2.57 --</i>	<i>0.001</i>
		<i>Comparison</i>	<i>1,162</i>	<i>68.55</i>		
Black	Officer	Ranch Hand	7	54.28	-13.32 --	0.121
		Comparison	6	67.59		
	Enlisted Flyer	Ranch Hand	9	60.61	-15.93 --	0.030
		Comparison	15	76.54		
	Enlisted Groundcrew	Ranch Hand	35	74.40	1.47 --	0.724
		Comparison	49	72.92		
Non-Black	Officer	Ranch Hand	350	67.70	1.75 --	0.146
		Comparison	481	65.95		
	Enlisted Flyer	Ranch Hand	148	71.06	0.55 --	0.784
		Comparison	180	70.51		
	Enlisted Groundcrew	Ranch Hand	371	74.09	4.17 --	0.001
		Comparison	501	69.92		

d) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Degreasing Chemical Exposure: Table 13-18)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log _e (Initial Dioxin)	
Stratum	Initial Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^d	p-Value
No	Low	67	67.46	0.0245 (0.0172)	0.155
	Medium	46	69.57		
	High	32	72.42		
Yes	Low	106	72.67	-0.0172 (0.0103)	0.096
	Medium	124	73.14		
	High	140	69.69		

Table I-2-9. (Continued)
Interaction Table for Alkaline Phosphatase (U/L)
(Continuous)

e) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Degreasing Chemical Exposure: Table 13-18)					
Stratum	Dioxin Category	n	Adjusted Mean^a	Difference of Adjusted Mean vs. Comparisons (95% C.I.)^b	p-Value^c
No	Comparison	366	68.59		
	Background RH	176	67.70	-0.89 --	0.575
	Low RH	94	67.74	-0.85 --	0.668
	High RH	51	69.49	0.90 --	0.735
	Low plus High RH	145	68.35	-0.24 --	0.885
Yes	Comparison	661	66.87		
	Background RH	190	71.43	4.56 --	0.002
	Low RH	160	72.77	5.90 --	<0.001
	High RH	203	68.94	2.08 --	0.136
	Low plus High RH	363	70.60	3.74 --	0.001

f) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Race: Table 13-18)					
Current Dioxin Category Summary Statistics				Analysis Results for Log₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean^a	Adjusted Slope (Std. Error)^d	p-Value
Black	Low	12	58.14	0.0516 (0.0307)	0.093
	Medium	20	64.94		
	High	15	70.81		
Non-Black	Low	275	71.34	-0.0128 (0.0068)	0.061
	Medium	271	71.72		
	High	274	68.70		

Table I-2-9. (Continued)
Interaction Table for Alkaline Phosphatase (U/L)
(Continuous)

g) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Race: Table 13-18)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^d	p-Value
Black	Low	12	58.80	0.0553 (0.0276)	0.045
	Medium	22	62.68		
	High	13	75.86		
Non-Black	Low	278	71.59	-0.0104 (0.0057)	0.071
	Medium	269	70.91		
	High	273	69.22		

h) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Race: Table 13-18)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^d	p-Value
Black	Low	12	59.26	0.0522 (0.0275)	0.058
	Medium	22	63.07		
	High	13	75.80		
Non-Black	Low	277	72.16	-0.0146 (0.0062)	0.019
	Medium	269	71.00		
	High	273	68.55		

^a Transformed from natural logarithm scale.

^b Difference of means after transformation to original scale; confidence interval on difference of means not presented because analysis was performed on natural logarithm scale.

^c P-value is based on difference of means on natural logarithm scale.

^d Slope and standard error based on natural logarithm of alkaline phosphatase versus log₂ dioxin.

Note: RH = Ranch Hand.

Model 2: Low = 39-98 ppt; Medium = >98-232 ppt; High = >232 ppt.

Model 3: Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Model 4: Low = ≤ 8.1 ppt; Medium = > 8.1-20.5 ppt; High = > 20.5 ppt.

Models 5 and 6: Low = ≤ 46 ppq; Medium = > 46-128 ppq; High = > 128 ppq.

Table I-2-10.
Interaction Table for Alkaline Phosphatase
(Discrete)

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Industrial Chemical Exposure: Table 13-19)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Initial Dioxin)	
Stratum	Initial Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.) ^a	p-Value
No	Low	72	4.2	0.31 (0.08,1.13)	0.076
	Medium	60	1.7		
	High	51	0.0		
Yes	Low	98	3.1	1.06 (0.74,1.50)	0.765
	Medium	105	8.6		
	High	118	7.6		

^a Relative risk for a twofold increase in initial dioxin.

Table I-2-11.
Interaction Table for Total Bilirubin (mg/dl)
(Continuous)

a) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Degreasing Chemical Exposure: Table 13-20)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
No	Low	149	0.59	0.0314 (0.0179)	0.079
	Medium	112	0.62		
	High	62	0.61		
Yes	Low	141	0.63	-0.0090 (0.0122)	0.464
	Medium	186	0.63		
	High	234	0.60		

^a Transformed from natural logarithm scale.

^b Slope and standard error based on natural logarithm of total bilirubin versus log₂ dioxin.

Note: Low = ≤8.1 ppt; Medium = >8.1-20.5 ppt; High = >20.5 ppt.

Table I-2-12.
Interaction Table for Total Bilirubin
(Discrete)

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Industrial Chemical Exposure: Table 13-21)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log₂ (Initial Dioxin)	
Stratum	Initial Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.)^a	p-Value
No	Low	72	2.8	1.66 (0.90,3.07)	0.104
	Medium	60	0.0		
	High	50	6.0		
Yes	Low	98	10.2	0.73 (0.50,1.07)	0.109
	Medium	105	3.8		
	High	117	4.3		

b) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Degreasing Chemical Exposure: Table 13-21)					
Current Dioxin Category Summary Statistics				Analysis Results for Log₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.)^b	p-Value
No	Low	149	4.7	1.26 (0.92,1.72)	0.155
	Medium	111	5.4		
	High	62	8.1		
Yes	Low	140	6.4	0.76 (0.57,1.01)	0.057
	Medium	184	5.4		
	High	229	3.1		

c) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Degreasing Chemical Exposure: Table 13-21)					
Current Dioxin Category Summary Statistics				Analysis Results for Log₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.)^b	p-Value
No	Low	143	4.2	1.26 (0.95,1.67)	0.103
	Medium	117	4.3		
	High	62	11.3		
Yes	Low	149	6.7	0.83 (0.67,1.04)	0.103
	Medium	178	5.1		
	High	226	3.1		

Table I-2-12. (Continued)
Interaction Table for Total Bilirubin
(Discrete)

d) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Degreasing Chemical Exposure: Table 13-21)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.) ^b	p-Value
No	Low	143	4.2	1.17 (0.88,1.55)	0.287
	Medium	117	4.3		
	High	62	11.3		
Yes	Low	148	6.8	0.77 (0.61,0.99)	0.038
	Medium	178	5.1		
	High	226	3.1		

^a Relative risk for a twofold increase in initial dioxin.

^b Relative risk for a twofold increase in current dioxin.

Note: Model 2: Low = 39-98 ppt; Medium = >98-232 ppt; High = >232 ppt.
 Model 4: Low = ≤8.1 ppt; Medium = >8.1-20.5 ppt; High = >20.5 ppt.
 Models 5 and 6: Low = ≤46 ppq; Medium = >46-128 ppq; High = >128 ppq.

Table I-2-13.
Interaction Table for Direct Bilirubin

a) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Lifetime Alcohol History: Table 13-22)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.) ^a	p-Value
0-40 Drink-years	Low	221	0.9	1.43 (0.72,2.84)	0.307
	Medium	213	1.4		
	High	216	0.5		
>40 Drink-years	Low	66	1.5	0.89 (0.40,1.98)	0.778
	Medium	77	3.9		
	High	71	1.4		

b) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Lifetime Alcohol History: Table 13-22)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.) ^a	p-Value
0-40 Drink-years	Low	224	0.0	1.77 (0.97,3.21)	0.061
	Medium	215	2.3		
	High	211	0.5		
>40 Drink-years	Low	66	1.5	1.04 (0.55,1.99)	0.901
	Medium	75	2.7		
	High	73	2.7		

c) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Lifetime Alcohol History: Table 13-22)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.) ^a	p-Value
0-40 Drink-years	Low	223	0.0	1.05 (0.54,2.07)	0.878
	Medium	215	2.3		
	High	211	0.5		
>40 Drink-years	Low	66	1.5	0.78 (0.46,1.32)	0.362
	Medium	75	2.7		
	High	73	2.7		

^a Relative risk for a twofold increase in current dioxin.

Note: Model 4: Low = ≤8.1 ppt; Medium = >8.1-20.5 ppt; High = >20.5 ppt.

Models 5 and 6: Low = ≤46 ppq; Medium = >46-128 ppq; High = >128 ppq.

Table I-2-14.
Interaction Table for LDH (U/L)
(Continuous)

a) MODEL 1: RANCH HANDS VS. COMPARISONS — ADJUSTED (Group-by-Age: Table 13-23)						
Stratum	Occupational Category	Group	n	Adjusted Mean ^a	Difference of Adjusted Means (95% C.I.) ^b	p-Value ^c
<i>Born ≥ 1942</i>	<i>All</i>	<i>Ranch Hand</i>	<i>382</i>	<i>144.37</i>	<i>2.80--</i>	<i>0.096</i>
		<i>Comparison</i>	<i>540</i>	<i>141.57</i>		
<i>Born < 1942</i>	<i>All</i>	<i>Ranch Hand</i>	<i>534</i>	<i>146.17</i>	<i>-1.51--</i>	<i>0.308</i>
		<i>Comparison</i>	<i>691</i>	<i>147.69</i>		
Born ≥ 1942	Officer	Ranch Hand	77	142.11	4.90 --	0.170
		Comparison	121	137.21		
	Enlisted Flyer	Ranch Hand	37	139.55	-5.60 --	0.290
		Comparison	56	145.15		
	Enlisted Groundcrew	Ranch Hand	268	147.03	3.30 --	0.109
		Comparison	363	143.73		
Born < 1942	Officer	Ranch Hand	279	145.09	-2.27 --	0.267
		Comparison	366	147.36		
	Enlisted Flyer	Ranch Hand	119	144.44	-3.59 --	0.262
		Comparison	139	148.03		
	Enlisted Groundcrew	Ranch Hand	136	148.57	1.72 --	0.557
		Comparison	186	146.85		

Table I-2-14. (Continued)
Interaction Table for LDH (U/L)
(Continuous)

b) MODEL 1: RANCH HANDS VS. COMPARISONS — ADJUSTED (Group-by-Lifetime Alcohol History: Table 13-23)						
Stratum	Occupational Category	Group	n	Adjusted Mean ^a	Difference of Adjusted Means (95% C.I.) ^b	p-Value ^c
0 Drink-years	All	Ranch Hand	63	143.20	-2.57--	0.560
		Comparison	69	145.77		
> 0-40 Drink-years	All	Ranch Hand	624	145.69	-0.82--	0.545
		Comparison	840	146.51		
> 40 Drink-years	All	Ranch Hand	229	144.91	3.77--	0.082
		Comparison	322	141.13		
0 Drink-years	Officer	Ranch Hand	14	137.35	-2.68 --	0.745
		Comparison	23	140.03		
	Enlisted Flyer	Ranch Hand	14	138.02	-8.28 --	0.409
		Comparison	11	146.29		
	Enlisted Groundcrew	Ranch Hand	35	149.20	-1.20 --	0.848
		Comparison	35	150.41		
> 0-40 Drink-years	Officer	Ranch Hand	247	143.36	-1.33 --	0.529
		Comparison	337	144.69		
	Enlisted Flyer	Ranch Hand	95	142.77	-5.70 --	0.105
		Comparison	119	148.46		
	Enlisted Groundcrew	Ranch Hand	282	149.19	1.27 --	0.534
		Comparison	384	147.93		
> 40 Drink-years	Officer	Ranch Hand	95	141.92	1.47 --	0.662
		Comparison	127	140.45		
	Enlisted Flyer	Ranch Hand	47	143.15	0.44 --	0.928
		Comparison	65	142.72		
	Enlisted Groundcrew	Ranch Hand	87	149.15	7.92 --	0.025
		Comparison	130	141.24		

Table I-2-14. (Continued)
Interaction Table for LDH (U/L)
(Continuous)

c) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Age: Table 13-23)					
Stratum	Dioxin Category	n	Adjusted Mean^a	Difference of Adjusted Mean vs. Comparisons (95% C.I.)^b	p-Value^c
Born ≥ 1942	Comparison	438	143.63		
	Background RH	125	146.47	2.84 --	0.283
	Low RH	82	147.55	3.91 --	0.206
	High RH	149	144.22	0.59 --	0.810
	Low plus High RH	231	145.39	1.76 --	0.399
Born < 1942	Comparison	586	150.04		
	Background RH	237	148.95	-1.09 --	0.595
	Low RH	169	147.97	-2.07 --	0.368
	High RH	102	147.21	-2.83 --	0.326
	Low plus High RH	271	147.68	-2.36 --	0.227

d) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Race: Table 13-23)					
Stratum	Dioxin Category	n	Adjusted Mean^a	Difference of Adjusted Mean vs. Comparisons (95% C.I.)^b	p-Value^c
Black	Comparison	52	155.49		
	Background RH	15	136.20	-19.29 --	0.010
	Low RH	20	149.14	-6.35 --	0.367
	High RH	12	144.28	-11.21 --	0.184
	Low plus High RH	32	147.30	-8.19 --	0.170
Non-Black	Comparison	972	144.84		
	Background RH	347	146.19	1.35 --	0.411
	Low RH	231	145.12	0.28 --	0.880
	High RH	239	144.41	-0.43 --	0.823
	Low plus High RH	470	144.76	-0.08 --	0.956

Table I-2-14. (Continued)
Interaction Table for LDH (U/L)
(Continuous)

e) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Lifetime Alcohol History: Table 13-23)					
Stratum	Dioxin Category	n	Adjusted Mean ^a	Difference of Adjusted Mean vs. Comparisons (95% C.I.) ^b	p-Value ^c
0 Drink-years	Comparison	53	146.03		
	Background RH	20	135.68	-10.35 --	0.111
	Low RH	15	152.26	6.23 --	0.415
	High RH	24	143.44	-2.59 --	0.678
	Low plus High RH	39	146.77	0.74 --	0.891
>0-40 Drink-years	Comparison	696	149.05		
	Background RH	258	148.78	-0.27 --	0.891
	Low RH	169	147.45	-1.59 --	0.477
	High RH	164	146.58	-2.46 --	0.288
	Low plus High RH	333	147.02	-2.02 --	0.250
>40 Drink-years	Comparison	275	143.89		
	Background RH	84	148.61	4.71 --	0.143
	Low RH	67	146.18	2.29 --	0.511
	High RH	63	147.50	3.61 --	0.316
	Low plus High RH	130	146.82	2.93 --	0.282

^a Transformed from natural logarithm scale.

^b Difference of means after transformation to original scale; confidence interval on difference of means not presented because analysis was performed on natural logarithm scale.

^c P-value is based on difference of means on natural logarithm scale.

Note: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, $10 \text{ ppt} < \text{Initial Dioxin} \leq 143$ ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table I-2-15.
Interaction Table for LDH
(Discrete)

a) MODEL 1: RANCH HANDS VS. COMPARISONS — ADJUSTED (Group-by-Current Alcohol Use: Table 13-24)						
Stratum	Occupational Category	Group	n	Percent High	Adj. Relative Risk (95% C.I.)	p-Value
<i>0-1 Drinks/Day</i>	<i>All</i>	<i>Ranch Hand</i>	<i>718</i>	<i>12.7</i>	<i>0.90 (0.67,1.19)</i>	<i>0.457</i>
		<i>Comparison</i>	<i>980</i>	<i>14.2</i>		
<i>>1-4 Drinks/Day</i>	<i>All</i>	<i>Ranch Hand</i>	<i>181</i>	<i>18.2</i>	<i>1.69 (0.96,2.98)</i>	<i>0.069</i>
		<i>Comparison</i>	<i>212</i>	<i>11.8</i>		
<i>>4 Drinks/Day</i>	<i>All</i>	<i>Ranch Hand</i>	<i>17</i>	<i>47.1</i>	<i>2.64 (0.74,9.45)</i>	<i>0.136</i>
		<i>Comparison</i>	<i>39</i>	<i>20.5</i>		
0-1 Drinks/Day	Officer	Ranch Hand	250	11.2	0.82 (0.52,1.29)	0.384
		Comparison	366	12.6		
	Enlisted Flyer	Ranch Hand	126	12.7	0.81 (0.43,1.52)	0.520
		Comparison	149	16.1		
	Enlisted Groundcrew	Ranch Hand	342	13.7	0.98 (0.67,1.44)	0.936
		Comparison	465	14.8		
>1-4 Drinks/Day	Officer	Ranch Hand	99	16.2	1.59 (0.85,2.98)	0.150
		Comparison	109	13.8		
	Enlisted Flyer	Ranch Hand	25	20.0	1.58 (0.71,3.52)	0.262
		Comparison	35	11.4		
	Enlisted Groundcrew	Ranch Hand	57	21.1	1.91 (0.99,3.70)	0.054
		Comparison	68	8.8		
>4 Drinks/Day	Officer	Ranch Hand	7	28.6	2.46 (0.65,9.28)	0.183
		Comparison	12	16.7		
	Enlisted Flyer	Ranch Hand	5	40.0	2.45 (0.63,9.58)	0.197
		Comparison	11	18.2		
	Enlisted Groundcrew	Ranch Hand	5	80.0	2.97 (0.79,11.10)	0.106
		Comparison	16	25.0		

Table I-2-15. (Continued)
Interaction Table for LDH
(Discrete)

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Lifetime Alcohol History: Table 13-24)					
Stratum	Dioxin Category	n	Percent High	Adjusted Relative Risk (95% C.I.) ^a	p-Value
0-40 Drink-years	Comparison	749	15.5		
	Background RH	278	12.2	0.91 (0.59,1.39)	0.658
	Low RH	184	12.5	0.73 (0.45,1.19)	0.210
	High RH	188	14.9	0.88 (0.55,1.40)	0.577
	Low plus High RH	372	13.7	0.80 (0.55,1.15)	0.232
>40 Drink-years	Comparison	275	10.2		
	Background RH	84	16.7	2.15 (1.05,4.40)	0.036
	Low RH	67	11.9	1.27 (0.54,3.00)	0.578
	High RH	63	19.0	1.83 (0.84,3.97)	0.126
	Low plus High RH	130	15.4	1.55 (0.82,2.93)	0.180

^a Relative risk and confidence interval relative to Comparisons.

Note: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, $10 \text{ ppt} < \text{Initial Dioxin} \leq 143$ ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table I-2-16.
Interaction Table for Cholesterol (mg/dl)
(Continuous)

a) MODEL 1: RANCH HANDS VS. COMPARISONS — ADJUSTED (Group-by-Current Alcohol Use: Table 13-25)						
Stratum	Occupational Category	Group	n	Adjusted Mean ^a	Difference of Adjusted Means (95% C.I.) ^b	p-Value ^c
0-1 Drinks/Day	All	Ranch Hand	719	213.51	-0.70 --	0.708
		Comparison	980	214.21		
>1-4 Drinks/Day	All	Ranch Hand	181	224.29	2.68 --	0.506
		Comparison	213	221.61		
>4 Drinks/Day	All	Ranch Hand	17	240.42	23.12 --	0.052
		Comparison	39	217.31		
0-1 Drinks/Day	Officer	Ranch Hand	251	210.99	1.96 --	0.527
		Comparison	366	209.04		
	Enlisted Flyer	Ranch Hand	126	213.59	-5.47 --	0.244
		Comparison	149	219.06		
	Enlisted Groundcrew	Ranch Hand	342	213.90	-1.07 --	0.695
		Comparison	465	214.97		
>1-4 Drinks/Day	Officer	Ranch Hand	99	219.80	0.84 --	0.878
		Comparison	109	218.96		
	Enlisted Flyer	Ranch Hand	25	236.81	7.84 --	0.473
		Comparison	35	228.96		
	Enlisted Groundcrew	Ranch Hand	57	221.59	3.75 --	0.595
		Comparison	69	217.84		
>4 Drinks/Day	Officer	Ranch Hand	7	239.64	25.35 --	0.190
		Comparison	12	214.30		
	Enlisted Flyer	Ranch Hand	5	229.77	1.08 --	0.961
		Comparison	11	228.68		
	Enlisted Groundcrew	Ranch Hand	5	250.76	38.91 --	0.066
		Comparison	16	211.85		

Table I-2-16. (Continued)
Interaction Table for Cholesterol (mg/dl)
(Continuous)

b) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Degreasing Chemical Exposure: Table 13-25)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log₂ (Initial Dioxin)	
Stratum	Initial Dioxin	n	Adjusted Mean^a	Adjusted Slope (Std. Error)^d	p-Value
No	Low	67	206.53	0.0333 (0.0116)	0.004
	Medium	46	213.93		
	High	32	225.18		
Yes	Low	104	220.80	0.0027 (0.0074)	0.715
	Medium	121	214.07		
	High	138	219.23		

c) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Lifetime Alcohol History: Table 13-25)					
Stratum	Dioxin Category	n	Adjusted Mean^a	Difference of Adjusted Mean vs. Comparisons (95% C.I.)^b	p-Value^c
0 Drink-years	Comparison	53	214.54		
	Background RH	20	198.73	-15.81 --	0.013
	Low RH	15	210.64	-3.91 --	0.722
	High RH	24	235.06	20.51 --	0.041
	Low plus High RH	39	225.35	10.80 --	0.197
>0-40 Drink-years	Comparison	696	218.70		
	Background RH	258	224.74	6.04 --	0.039
	Low RH	169	219.73	1.03 --	0.756
	High RH	164	220.28	1.58 --	0.650
	Low plus High RH	333	220.00	1.30 --	0.619
>40 Drink-years	Comparison	276	221.14		
	Background RH	84	211.00	-10.14--	0.036
	Low RH	67	217.68	-3.46--	0.515
	High RH	63	219.92	-1.22--	0.827
	Low plus High RH	130	218.76	-2.38	0.567

^a Transformed from natural logarithm scale.

^b Difference of means after transformation to original scale; confidence interval on difference of means not presented because analysis was performed on natural logarithm scale.

^c P-value is based on difference of means on natural logarithm scale.

^d Slope and standard error based on natural logarithm of cholesterol versus log₂ dioxin.

Note: Model 2: Low = 39-98 ppt; Medium = >98-232 ppt; High = >232 ppt.

Model 3: RH = Ranch Hand.

Comparison: Current Dioxin ≤10 ppt.

Background (Ranch Hand): Current Dioxin ≤10 ppt.

Low (Ranch Hand): Current Dioxin >10 ppt, 10 ppt < Initial Dioxin ≤143 ppt.

High (Ranch Hand): Current Dioxin >10 ppt, Initial Dioxin >143 ppt.

Table I-2-17.
Interaction Table for Cholesterol
(Discrete)

a) MODEL 1: RANCH HANDS VS. COMPARISONS — ADJUSTED (Group-by-Current Alcohol Use: Table 13-26)						
Stratum	Occupational Category	Group	n	Percent High	Adj. Relative Risk (95% C.I.)	p-Value
0-1 Drinks/Day	All	Ranch Hand	729	12.4	0.96 (0.72,1.28)	0.776
		Comparison	983	12.7		
>1-4 Drinks/Day	All	Ranch Hand	182	24.2	1.42 (0.87,2.31)	0.161
		Comparison	213	18.8		
>4 Drinks/Day	All	Ranch Hand	18	38.9	8.62 (1.87,39.77)	0.006
		Comparison	39	7.7		
0-1 Drinks/Day	Officer	Ranch Hand	254	7.9	0.90 (0.56,1.46)	0.675
		Comparison	367	8.5		
	Enlisted Flyer	Ranch Hand	129	14.7	1.31 (0.73,2.36)	0.363
		Comparison	150	14.0		
>1-4 Drinks/Day	Enlisted Groundcrew	Ranch Hand	346	14.7	0.88 (0.61,1.28)	0.510
		Comparison	466	15.7		
	Officer	Ranch Hand	100	21.0	1.34 (0.76,2.36)	0.307
		Comparison	109	20.2		
>4 Drinks/Day	Enlisted Flyer	Ranch Hand	25	48.0	1.95 (0.95,4.02)	0.068
		Comparison	35	17.1		
	Enlisted Groundcrew	Ranch Hand	57	19.3	1.31 (0.73,2.35)	0.361
		Comparison	69	17.4		
>4 Drinks/Day	Officer	Ranch Hand	7	42.9	7.76 (1.61,37.52)	0.011
		Comparison	12	0.0		
	Enlisted Flyer	Ranch Hand	5	20.0	11.30 (2.30,55.64)	0.003
		Comparison	11	9.1		
>4 Drinks/Day	Enlisted Groundcrew	Ranch Hand	6	50.0	7.59 (1.59,36.16)	0.011
		Comparison	16	12.5		

Table I-2-17. (Continued)
Interaction Table for Cholesterol
(Discrete)

b) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Degreasing Chemical Exposure: Table 13-26)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Initial Dioxin)	
Stratum	Initial Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.) ^a	p-Value
No	Low	66	10.6	1.45 (1.03,2.03)	0.033
	Medium	46	15.2		
	High	31	22.6		
Yes	Low	104	19.2	0.95 (0.75,1.20)	0.651
	Medium	119	14.3		
	High	136	14.7		

c) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Lifetime Alcohol History: Table 13-26)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Initial Dioxin)	
Stratum	Initial Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.) ^a	p-Value
0 Drink-years	Low	10	10.0	1.52 (0.74,3.10)	0.254
	Medium	12	8.3		
	High	17	17.6		
> 0-40 Drink-years	Low	119	16.8	0.99 (0.77,1.27)	0.947
	Medium	107	15.0		
	High	107	15.0		
> 40 Drink-years	Low	41	14.6	1.17 (0.82,1.67)	0.376
	Medium	46	15.2		
	High	43	18.6		

Table I-2-17. (Continued)
Interaction Table for Cholesterol
(Discrete)

d) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Current Alcohol Use: Table 13-26)					
Stratum	Dioxin Category	n	Percent High	Adjusted Relative Risk (95% C.I.) ^b	p-Value
0-1 Drinks/Day	Comparison	816	12.0		
	Background RH	284	10.9	1.02 (0.66,1.59)	0.923
	Low RH	194	10.3	0.81 (0.48,1.35)	0.420
	High RH	208	14.9	1.11 (0.71,1.74)	0.648
	Low plus High RH	402	12.7	0.97 (0.67,1.40)	0.872
>1-4 Drinks/Day	Comparison	176	17.0		
	Background RH	74	18.9	1.31 (0.64,2.68)	0.463
	Low RH	57	31.6	2.58 (1.29,5.19)	0.008
	High RH	41	24.4	1.30 (0.56,2.98)	0.541
	Low plus High RH	98	28.6	1.94 (1.06,3.52)	0.030
>4 Drinks/Day	Comparison	35	8.6		
	Background RH	9	55.6	16.42 (2.74,98.48)	0.002
	Low RH	3	0.0	--	--
	High RH	5	40.0	4.78 (0.54,41.95)	0.158
	Low plus High RH	8	25.0	3.10 (0.40,24.02)	0.278

Table I-2-17. (Continued)
Interaction Table for Cholesterol
(Discrete)

e) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Occupation: Table 13-26)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.) ^c	p-Value
Officer	Low	186	7.0	1.88 (1.28,2.76)	0.001
	Medium	134	16.4		
	High	19	36.8		
Enlisted Flyer	Low	32	21.9	1.03 (0.77,1.39)	0.835
	Medium	55	16.4		
	High	59	16.9		
Enlisted Groundcrew	Low	72	18.1	1.11 (0.94,1.31)	0.228
	Medium	101	10.9		
	High	206	17.0		

^a Relative risk for a twofold increase in initial dioxin.

^b Relative risk and confidence interval relative to Comparisons.

^c Relative risk for a twofold increase in current dioxin.

--: Adjusted relative risk, confidence interval, and p-value not presented due to the sparse number of abnormalities.

Note: Model 2: Low = 39-98 ppt; Medium = >98-232 ppt; High = >232 ppt.

Model 3: RH = Ranch Hand.

Comparison: Current Dioxin ≤10 ppt.

Background (Ranch Hand): Current Dioxin ≤10 ppt.

Low (Ranch Hand): Current Dioxin >10 ppt, 10 ppt < Initial Dioxin ≤143 ppt.

High (Ranch Hand): Current Dioxin >10 ppt, Initial Dioxin >143 ppt.

Models 5: Low = ≤46 ppq; Medium = >46-128 ppq; High = >128 ppq.

Table I-2-18.
Interaction Table for HDL Cholesterol (mg/dl)
(Continuous)

a) MODEL 1: RANCH HANDS VS. COMPARISONS — ADJUSTED (Group-by-Current Alcohol Use: Table 13-27)						
Stratum	Occupational Category	Group	n	Adjusted Mean ^a	Difference of Adjusted Means (95% C.I.) ^b	p-Value ^c
0-1 Drinks/Day	All	Ranch Hand	710	41.33	-0.36 --	0.473
		Comparison	970	41.69		
>1-4 Drinks/Day	All	Ranch Hand	176	46.67	0.06 --	0.962
		Comparison	212	46.62		
>4 Drinks/Day	All	Ranch Hand	17	47.80	2.95 --	0.374
		Comparison	39	44.85		
0-1 Drinks/Day	Officer	Ranch Hand	246	43.30	0.16 --	0.859
		Comparison	364	43.15		
	Enlisted Flyer	Ranch Hand	123	41.34	0.60 --	0.627
		Comparison	146	40.74		
	Enlisted Groundcrew	Ranch Hand	341	40.00	-1.05 --	0.139
		Comparison	460	41.05		
>1-4 Drinks/Day	Officer	Ranch Hand	96	47.16	-2.45 --	0.141
		Comparison	108	49.61		
	Enlisted Flyer	Ranch Hand	24	47.50	3.91 --	0.188
		Comparison	35	43.59		
	Enlisted Groundcrew	Ranch Hand	56	47.46	2.17 --	0.292
		Comparison	69	45.29		
>4 Drinks/Day	Officer	Ranch Hand	7	52.70	7.84 --	0.168
		Comparison	12	44.86		
	Enlisted Flyer	Ranch Hand	5	43.99	-2.13 --	0.734
		Comparison	11	46.12		
	Enlisted Groundcrew	Ranch Hand	5	47.40	2.50 --	0.672
		Comparison	16	44.90		

Table I-2-18. (Continued)
Interaction Table for HDL Cholesterol (mg/dl)
(Continuous)

b) MODEL 1: RANCH HANDS VS. COMPARISONS — ADJUSTED (Group-by-Lifetime Alcohol History: Table 13-27)						
Stratum	Occupational Category	Group	n	Adjusted Mean^a	Difference of Adjusted Means (95% C.I.)^b	p-Value^c
<i>0 Drink-years</i>	<i>All</i>	<i>Ranch Hand</i>	62	40.23	<i>1.19 --</i>	<i>0.484</i>
		<i>Comparison</i>	69	39.04		
<i>> 0-40 Drink-years</i>	<i>All</i>	<i>Ranch Hand</i>	618	42.63	<i>-0.31 --</i>	<i>0.576</i>
		<i>Comparison</i>	832	42.94		
<i>> 40 Drink-years</i>	<i>All</i>	<i>Ranch Hand</i>	223	43.16	<i>0.08 --</i>	<i>0.933</i>
		<i>Comparison</i>	320	43.08		
<i>0 Drink-years</i>	<i>Officer</i>	<i>Ranch Hand</i>	14	40.64	<i>1.84 --</i>	<i>0.576</i>
		<i>Comparison</i>	23	38.79		
	<i>Enlisted Flyer</i>	<i>Ranch Hand</i>	13	41.13	<i>3.45 --</i>	<i>0.381</i>
		<i>Comparison</i>	11	37.67		
	<i>Enlisted Groundcrew</i>	<i>Ranch Hand</i>	35	39.31	<i>-0.33 --</i>	<i>0.886</i>
		<i>Comparison</i>	35	39.64		
<i>> 0-40 Drink-years</i>	<i>Officer</i>	<i>Ranch Hand</i>	244	44.53	<i>-0.16 --</i>	<i>0.862</i>
		<i>Comparison</i>	335	44.69		
	<i>Enlisted Flyer</i>	<i>Ranch Hand</i>	93	43.01	<i>1.45 --</i>	<i>0.314</i>
		<i>Comparison</i>	117	41.56		
	<i>Enlisted Groundcrew</i>	<i>Ranch Hand</i>	281	41.25	<i>-0.98 --</i>	<i>0.220</i>
		<i>Comparison</i>	380	42.23		
<i>> 40 Drink-years</i>	<i>Officer</i>	<i>Ranch Hand</i>	91	44.48	<i>-0.82 --</i>	<i>0.586</i>
		<i>Comparison</i>	126	45.30		
	<i>Enlisted Flyer</i>	<i>Ranch Hand</i>	46	42.01	<i>-0.04 --</i>	<i>0.986</i>
		<i>Comparison</i>	64	42.04		
	<i>Enlisted Groundcrew</i>	<i>Ranch Hand</i>	86	42.93	<i>1.00 --</i>	<i>0.488</i>
		<i>Comparison</i>	130	41.93		

Table I-2-18. (Continued)
Interaction Table for HDL Cholesterol (mg/dl)
(Continuous)

c) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Current Alcohol Use: Table 13-27)					
Stratum	Dioxin Category	n	Adjusted Mean ^a	Difference of Adjusted Mean vs. Comparisons (95% C.I.) ^b	p-Value ^c
0-1 Drinks/Day	Comparison	806	41.72		
	Background RH	277	42.24	0.52 --	0.463
	Low RH	190	41.19	-0.54 --	0.499
	High RH	202	40.41	-1.31 --	0.096
	Low plus High RH	392	40.78	-0.94 --	0.125
>1-4 Drinks/Day	Comparison	175	46.23		
	Background RH	73	45.64	-0.60 --	0.697
	Low RH	54	46.74	0.51 --	0.768
	High RH	39	48.20	1.97 --	0.330
	Low plus High RH	93	47.35	1.11 --	0.435
>4 Drinks/Day	Comparison	35	47.02		
	Background RH	8	50.16	3.14 --	0.489
	Low RH	3	64.81	17.79 --	0.025
	High RH	5	44.78	-2.24 --	0.673
	Low plus High RH	8	51.44	4.42 --	0.344

Table I-2-18. (Continued)
Interaction Table for HDL Cholesterol (mg/dl)
(Continuous)

d) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Lifetime Alcohol History: Table 13-27)					
Stratum	Dioxin Category	n	Adjusted Mean^a	Difference of Adjusted Mean vs. Comparisons (95% C.I.)^b	p-Value^c
0 Drink-years	Comparison	53	40.20		
	Background RH	20	38.67	-1.53 --	0.534
	Low RH	15	39.01	-1.19 --	0.664
	High RH	23	42.07	1.87 --	0.442
	Low plus High RH	38	40.83	0.63 --	0.756
>0-40 Drink-years	Comparison	690	42.52		
	Background RH	255	43.52	1.00 --	0.190
	Low RH	168	42.48	-0.04 --	0.963
	High RH	162	40.89	-1.63 --	0.067
	Low plus High RH	330	41.69	-0.83 --	0.223
>40 Drink-years	Comparison	273	43.21		
	Background RH	83	42.66	-0.55 --	0.667
	Low RH	64	43.83	0.61 --	0.670
	High RH	61	43.73	0.51 --	0.728
	Low plus High RH	125	43.78	0.56 --	0.614

Table I-2-18. (Continued)
Interaction Table for HDL Cholesterol (mg/dl)
(Continuous)

e) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Current Alcohol Use: Table 13-27)					
Current Dioxin Category Summary Statistics				Analysis Results for Log₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean^a	Adjusted Slope (Std. Error)^d	p-Value
0-1 Drinks/Day	Low	222	42.86	-0.0180 (0.0075)	0.017
	Medium	215	41.07		
	High	232	39.54		
>1-4 Drinks/Day	Low	56	49.85	-0.0351 (0.0172)	0.042
	Medium	67	47.48		
	High	43	45.21		
>4 Drinks/Day	Low	7	50.99	-0.0173 (0.0576)	0.764
	Medium	3	61.68		
	High	6	47.05		

f) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Lifetime Alcohol History: Table 13-27)					
Current Dioxin Category Summary Statistics				Analysis Results for Log₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean^a	Adjusted Slope (Std. Error)^d	p-Value
0 Drink-years	Low	17	39.81	0.0010 (0.0205)	0.962
	Medium	18	40.37		
	High	23	41.62		
>0-40 Drink-years	Low	202	45.13	-0.0304 (0.0081)	<0.001
	Medium	194	42.91		
	High	189	40.23		
>40 Drink-years	Low	66	43.06	-0.0079 (0.0124)	0.524
	Medium	73	42.22		
	High	69	41.38		

Table I-2-18. (Continued)
Interaction Table for HDL Cholesterol (mg/dl)
(Continuous)

g) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Current Alcohol Use: Table 13-27)					
Current Dioxin Category Summary Statistics				Analysis Results for Log _e (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^d	p-Value
0-1 Drinks/Day	Low	227	43.21	-0.0187 (0.0064)	0.004
	Medium	217	40.86		
	High	225	39.29		
>1-4 Drinks/Day	Low	57	50.81	-0.0361 (0.0146)	0.014
	Medium	66	47.53		
	High	43	44.36		
>4 Drinks/Day	Low	6	52.45	-0.0086 (0.0413)	0.834
	Medium	4	55.20		
	High	6	47.27		

h) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Lifetime Alcohol History: Table 13-27)					
Current Dioxin Category Summary Statistics				Analysis Results for Log _e (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^d	p-Value
0 Drink-years	Low	18	40.94	-0.0029 (0.0171)	0.867
	Medium	14	38.81		
	High	26	41.56		
>0-40 Drink-years	Low	206	45.50	-0.0313 (0.0070)	<0.001
	Medium	199	42.51		
	High	180	40.12		
>40 Drink-years	Low	66	43.81	-0.0091 (0.0103)	0.378
	Medium	74	42.59		
	High	68	40.20		

Table I-2-18. (Continued)
Interaction Table for HDL Cholesterol (mg/dl)
(Continuous)

i) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Current Alcohol Use: Table 13-27)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^d	p-Value
0-1 Drinks/Day	Low	226	42.20	-0.0101 (0.0067)	0.133
	Medium	217	40.38		
	High	225	39.70		
> 1-4 Drinks/Day	Low	57	49.75	-0.0260 (0.0147)	0.077
	Medium	66	47.54		
	High	43	45.04		
> 4 Drinks/Day	Low	6	53.77	-0.0111 (0.0409)	0.786
	Medium	4	57.70		
	High	6	47.84		

j) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Lifetime Alcohol History: Table 13-27)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^d	p-Value
0 Drink-years	Low	18	39.64	0.0063 (0.0171)	0.713
	Medium	14	38.21		
	High	26	42.10		
> 0-40 Drink-years	Low	205	44.55	-0.0228 (0.0073)	0.002
	Medium	199	42.26		
	High	180	40.67		
> 40 Drink-years	Low	66	42.77	-0.0006 (0.0103)	0.952
	Medium	74	42.13		
	High	68	40.72		

Table I-2-18. (Continued)
Interaction Table for HDL Cholesterol (mg/dl)
(Continuous)

k) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Degreasing Chemical Exposure: Table 13-27)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^d	p-Value
No	Low	143	44.80	-0.0315 (0.0096)	0.001
	Medium	114	41.54		
	High	57	39.13		
Yes	Low	146	42.74	-0.0053 (0.0070)	0.446
	Medium	173	42.22		
	High	217	41.17		

^a Transformed from natural logarithm scale.

^b Difference of means after transformation to original scale; confidence interval on difference of means not presented because analysis was performed on natural logarithm scale.

^c P-value is based on difference of means on natural logarithm scale.

^d Slope and standard error based on natural logarithm of HDL cholesterol versus log₂ dioxin.

Note: RH = Ranch Hand.

Model 3: Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Model 4: Low = ≤ 8.1 ppt; Medium = > 8.1-20.5 ppt; High = > 20.5 ppt.

Models 5 and 6: Low = ≤ 46 ppq; Medium = > 46-128 ppq; High = > 128 ppq.

Table I-2-19.
Interaction Table for HDL Cholesterol
(Discrete)

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Lifetime Alcohol History: Table 13-28)					
Stratum	Dioxin Category	n	Percent Low	Adjusted Relative Risk (95% C.I.)^a	p-Value
0 Drink-years	Comparison	53	20.8		
	Background RH	20	15.0	0.87 (0.21,3.57)	0.849
	Low RH	15	13.3	0.65 (0.12,3.35)	0.603
	High RH	23	13.0	0.55 (0.14,2.24)	0.405
	Low plus High RH	38	13.2	0.59 (0.18,1.88)	0.370
>0-40 Drink-years	Comparison	690	8.8		
	Background RH	255	9.0	1.18 (0.71,1.97)	0.514
	Low RH	168	10.1	1.09 (0.62,1.95)	0.758
	High RH	162	14.2	1.53 (0.91,2.58)	0.111
	Low plus High RH	330	12.1	1.31 (0.85,2.01)	0.223
>40 Drink-years	Comparison	273	5.1		
	Background RH	83	12.0	3.05 (1.28,7.28)	0.012
	Low RH	64	4.7	0.96 (0.26,3.55)	0.956
	High RH	61	8.2	1.51 (0.51,4.48)	0.460
	Low plus High RH	125	6.4	1.24 (0.50,3.08)	0.645

b) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Lifetime Alcohol History: Table 13-28)					
Current Dioxin Category Summary Statistics				Analysis Results for Log₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent Low	Adjusted Relative Risk (95% C.I.)^b	p-Value
0 Drink-years	Low	17	11.8	1.06 (0.66,1.69)	0.808
	Medium	18	16.7		
	High	23	13.0		
>0-40 Drink-years	Low	202	8.9	1.13 (0.95,1.35)	0.159
	Medium	194	9.3		
	High	189	14.3		
>40 Drink-years	Low	66	10.6	0.76 (0.54,1.08)	0.131
	Medium	73	8.2		
	High	69	7.2		

Table I-2-19. (Continued)
Interaction Table for HDL Cholesterol
(Discrete)

c) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Lifetime Alcohol History: Table 13-28)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent Low	Adjusted Relative Risk (95% C.I.) ^b	p-Value
0 Drink-years	Low	18	16.7	1.07 (0.71,1.62)	0.740
	Medium	14	14.3		
	High	26	11.5		
>0-40 Drink-years	Low	206	8.7	1.25 (1.06,1.47)	0.008
	Medium	199	9.0		
	High	180	15.0		
>40 Drink-years	Low	66	10.6	0.84 (0.64,1.11)	0.225
	Medium	74	6.8		
	High	68	8.8		

d) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Lifetime Alcohol History: Table 13-28)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent Low	Adjusted Relative Risk (95% C.I.) ^b	p-Value
0 Drink-years	Low	18	16.7	0.98 (0.65,1.47)	0.911
	Medium	14	14.3		
	High	26	11.5		
>0-40 Drink-years	Low	205	8.8	1.10 (0.93,1.31)	0.275
	Medium	199	9.0		
	High	180	15.0		
>40 Drink-years	Low	66	10.6	0.77 (0.59,1.01)	0.062
	Medium	74	6.8		
	High	68	8.8		

^a Relative risk and confidence interval relative to Comparisons.

^b Relative risk for a twofold increase in current dioxin.

Note: Model 3: RH = Ranch Hand.

Comparison: Current Dioxin ≤10 ppt.

Background (Ranch Hand): Current Dioxin ≤10 ppt.

Low (Ranch Hand): Current Dioxin >10 ppt, 10 ppt < Initial Dioxin ≤143 ppt.

High (Ranch Hand): Current Dioxin >10 ppt, Initial Dioxin >143 ppt.

Model 4: Low = ≤8.1 ppt; Medium = >8.1-20.5 ppt; High = >20.5 ppt.

Models 5 and 6: Low = ≤46 ppq; Medium = >46-128 ppq; High = >128 ppq.

Table I-2-20.
Interaction Table for Cholesterol-HDL Ratio
(Continuous)

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Current Alcohol Use: Table 13-29)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log_e (Initial Dioxin)	
Stratum	Initial Dioxin	n	Adjusted Mean^a	Adjusted Slope (Std. Error)^b	p-Value
0-1 Drinks/Day	Low	128	5.25	0.0049 (0.0117)	0.672
	Medium	130	5.22		
	High	134	5.23		
>1-4 Drinks/Day	Low	39	4.68	0.0477 (0.0257)	0.064
	Medium	27	4.98		
	High	27	4.91		
>4 Drinks/Day	Low	2	--	0.1874 (0.1051)	0.075
	Medium	4	--		
	High	2	--		

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Current Alcohol Use: Table 13-29)					
Stratum	Dioxin Category	n	Adjusted Mean^a	Difference of Adjusted Means vs. Comparisons (95% C.I.)^c	p-Value^d
0-1 Drinks/Day	Comparison	808	5.15		
	Background RH	281	5.09	-0.06 --	0.511
	Low RH	192	5.17	0.02 --	0.860
	High RH	205	5.36	0.20 --	0.078
	Low plus High RH	397	5.27	0.11 --	0.198
>1-4 Drinks/Day	Comparison	175	4.78		
	Background RH	73	4.89	0.12 --	0.524
	Low RH	55	4.85	0.08 --	0.710
	High RH	39	4.60	-0.17 --	0.443
	Low plus High RH	94	4.75	-0.03 --	0.857
>4 Drinks/Day	Comparison	35	4.72		
	Background RH	9	4.98	0.26 --	0.597
	Low RH	3	3.39	-1.33 --	0.042
	High RH	5	5.07	0.34 --	0.591
	Low plus High RH	8	4.36	-0.37 --	0.449

Table I-2-20. (Continued)
Interaction Table for Cholesterol-HDL Ratio
(Continuous)

c) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Degreasing Chemical Exposure: Table 13-29)					
Current Dioxin Category Summary Statistics				Analysis Results for Log _e (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
No	Low	148	4.60	0.0498 (0.0121)	<0.001
	Medium	109	5.00		
	High	60	5.51		
Yes	Low	139	5.08	0.0178 (0.0084)	0.033
	Medium	181	5.04		
	High	225	5.34		

d) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Age: Table 13-29)					
Current Dioxin Category Summary Statistics				Analysis Results for Log _e (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
Born ≥ 1942	Low	101	4.60	0.0335 (0.0082)	<0.001
	Medium	94	5.21		
	High	160	5.27		
Born < 1942	Low	191	4.68	0.0464 (0.0083)	<0.001
	Medium	198	5.00		
	High	118	5.70		

Table I-2-20. (Continued)
Interaction Table for Cholesterol-HDL Ratio
(Continuous)

e) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Degreasing Chemical Exposure: Table 13-29)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
No	Low	143	4.96	0.0300 (0.0091)	0.001
	Medium	116	5.32		
	High	58	5.64		
Yes	Low	148	5.36	-0.0015 (0.0068)	0.825
	Medium	176	5.32		
	High	220	5.31		

^a Transformed from natural logarithm scale.

^b Slope and standard error based on natural logarithm of cholesterol-HDL ratio versus log₂ dioxin.

^c Difference of means after transformation to original scale; confidence interval on difference of means not presented because analysis was performed on natural logarithm scale.

^d P-value is based on difference of means on natural logarithm scale.

--: Adjusted mean not presented due to sparse cell sizes.

Note: Model 2: Low = 39-98 ppt; Medium = >98-232 ppt; High = >232 ppt.

Model 3: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Model 4: Low = ≤ 8.1 ppt; Medium = > 8.1-20.5 ppt; High = > 20.5 ppt.

Models 5 and 6: Low = ≤ 46 ppq; Medium = > 46-128 ppq; High = > 128 ppq.

Table I-2-21.
Interaction Table for Triglycerides (mg/dl)
(Continuous)

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Occupation: Table 13-31)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log₂ (Initial Dioxin)	
Stratum	Initial Dioxin	n	Adjusted Mean^a	Adjusted Slope (Std. Error)^b	p-Value
Officer	Low	77	127.30	0.2639 (0.0934)	0.005
	Medium	33	159.67		
	High	1	220.73		
Enlisted Flyer	Low	36	125.79	0.0716 (0.0503)	0.155
	Medium	43	129.71		
	High	31	144.96		
Enlisted Groundcrew	Low	60	131.79	0.0178 (0.0245)	0.469
	Medium	94	143.46		
	High	140	138.41		

b) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Occupation: Table 13-31)					
Current Dioxin Category Summary Statistics				Analysis Results for Log₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean^a	Adjusted Slope (Std. Error)^b	p-Value
Officer	Low	189	116.71	0.1509 (0.0374)	<0.001
	Medium	140	135.54		
	High	14	198.36		
Enlisted Flyer	Low	31	122.25	0.1003 (0.0373)	0.007
	Medium	57	115.07		
	High	62	148.05		
Enlisted Groundcrew	Low	70	116.53	0.0485 (0.0180)	0.007
	Medium	101	127.70		
	High	220	145.53		

Table I-2-21. (Continued)
Interaction Table for Triglycerides (mg/dl)
(Continuous)

c) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Occupation and Lifetime Alcohol History: Table 13-31)					
Current Dioxin Category Summary Statistics				Analysis Results for Log _e (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
Officer, 0 Drink-years	Low	7	120.13	0.1498 (0.1483)	0.313
	Medium	5	95.93		
	High	2	278.09		
Officer, >0-40 Drink-years	Low	136	107.28	0.2312 (0.0345)	<0.001
	Medium	89	143.76		
	High	10	312.21		
Officer, >40 Drink-years	Low	43	108.39	0.1146 (0.0441)	0.009
	Medium	40	138.60		
	High	7	271.87		
Enlisted Flyer, 0 Drink-years	Low	1	59.78	0.2827 (0.0928)	0.002
	Medium	5	125.92		
	High	7	190.26		
Enlisted Flyer, >0-40 Drink-years	Low	25	125.02	0.0907 (0.0409)	0.027
	Medium	36	121.21		
	High	28	149.58		
Enlisted Flyer, >40 Drink-years	Low	6	72.68	0.2119 (0.0619)	<0.001
	Medium	14	103.47		
	High	24	153.79		
Enlisted Groundcrew, 0 Drink-years	Low	10	111.25	0.1043 (0.0449)	0.020
	Medium	4	112.46		
	High	18	173.64		
Enlisted Groundcrew, >0-40 Drink-years	Low	45	111.04	0.0695 (0.0199)	<0.001
	Medium	76	124.69		
	High	146	147.41		
Enlisted Groundcrew, >40 Drink-years	Low	17	121.11	0.0626 (0.0307)	0.042
	Medium	21	131.54		
	High	42	160.74		

Table I-2-21. (Continued)
Interaction Table for Triglycerides (mg/dl)
(Continuous)

d) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Occupation and Lifetime Alcohol History: Table 13-31)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
Officer, 0 Drink-years	Low	7	149.68	-0.0084 (0.1179)	0.943
	Medium	5	94.27		
	High	2	198.65		
Officer, >0-40 Drink-years	Low	136	129.28	0.1020 (0.0291)	<0.001
	Medium	89	142.78		
	High	10	183.89		
Officer, >40 Drink-years	Low	43	133.14	0.0268 (0.0361)	0.458
	Medium	40	145.99		
	High	7	197.95		
Enlisted Flyer, 0 Drink-years	Low	1	123.22	0.0898 (0.0770)	0.244
	Medium	5	146.97		
	High	7	157.83		
Enlisted Flyer, >0-40 Drink-years	Low	24	137.44	0.0327 (0.0387)	0.398
	Medium	36	133.89		
	High	28	132.09		
Enlisted Flyer, >40 Drink-years	Low	6	93.55	0.0980 (0.0512)	0.056
	Medium	14	116.53		
	High	24	139.40		
Enlisted Groundcrew, 0 Drink-years	Low	10	144.75	0.0375 (0.0371)	0.312
	Medium	4	149.23		
	High	18	161.05		
Enlisted Groundcrew, >0-40 Drink-years	Low	45	125.74	0.0104 (0.0164)	0.527
	Medium	76	133.42		
	High	146	136.93		
Enlisted Groundcrew, >40 Drink-years	Low	17	134.80	0.0075 (0.0255)	0.769
	Medium	21	140.83		
	High	42	145.14		

^a Transformed from natural logarithm scale.

^b Slope and standard error based on natural logarithm of triglycerides versus log₂ dioxin.

Note: RH = Ranch Hand.

Model 2: Low = 39-98 ppt; Medium = >98-232 ppt; High = >232 ppt.

Models 5 and 6: Low = ≤46 ppq; Medium = >46-128 ppq; High = >128 ppq.

Table I-2-22.
Interaction Table for Creatine Kinase (U/L)
(Continuous)

a) MODEL 1: RANCH HANDS VS. COMPARISONS — ADJUSTED (Group-by-Race: Table 13-33)						
Stratum	Occupational Category	Group	n	Adjusted Mean ^a	Difference of Adjusted Means (95% C.I.) ^b	p-Value ^c
<i>Black</i>	<i>All</i>	<i>Ranch Hand</i>	<i>51</i>	<i>191.16</i>	<i>-72.90--</i>	<i>0.001</i>
		<i>Comparison</i>	<i>70</i>	<i>264.06</i>		
<i>Non-Black</i>	<i>All</i>	<i>Ranch Hand</i>	<i>866</i>	<i>125.33</i>	<i>1.44--</i>	<i>0.621</i>
		<i>Comparison</i>	<i>1,162</i>	<i>123.89</i>		
Black	Officer	Ranch Hand	7	178.12	-70.20--	0.253
		Comparison	6	248.33		
	Enlisted Flyer	Ranch Hand	9	129.17	-120.56--	0.003
		Comparison	15	249.73		
	Enlisted Groundcrew	Ranch Hand	35	213.91	-55.98--	0.048
		Comparison	49	269.90		
Non-Black	Officer	Ranch Hand	350	129.22	4.20--	0.367
		Comparison	481	125.02		
	Enlisted Flyer	Ranch Hand	147	119.72	-2.44--	0.728
		Comparison	180	122.17		
	Enlisted Groundcrew	Ranch Hand	369	123.53	0.59--	0.894
		Comparison	501	122.94		

Table I-2-22. (Continued)
Interaction Table for Creatine Kinase (U/L)
(Continuous)

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Race and Lifetime Alcohol History: Table 13-33)					
Stratum	Dioxin Category	n	Adjusted Mean^a	Difference of Adjusted Mean vs. Comparisons (95% C.I.)^b	p-Value^c
Black, 0 Drink-years	Comparison	5	263.75		
	Background RH	2	262.51	-1.24 --	0.991
	Low RH	1	73.78	-189.97 --	0.026
	High RH	2	134.97	-128.78 --	0.121
	Low plus High RH	3	110.36	-153.39 --	0.021
Black, >0-40 Drink-years	Comparison	38	286.59		
	Background RH	11	185.37	-101.22 --	0.013
	Low RH	11	185.66	-100.93 --	0.013
	High RH	6	177.91	-108.68 --	0.034
	Low plus High RH	17	182.88	-103.71 --	0.003
Black, >40 Drink-years	Comparison	9	225.35		
	Background RH	2	112.14	-113.21 --	0.081
	Low RH	8	275.59	50.24 --	0.419
	High RH	4	334.50	109.15 --	0.199
	Low plus High RH	12	293.97	68.62 --	0.240
Non-Black, 0 Drink-years	Comparison	48	121.79		
	Background RH	18	104.67	-17.12 --	0.291
	Low RH	14	126.43	4.64 --	0.810
	High RH	22	154.21	32.42 --	0.083
	Low plus High RH	36	142.74	20.95 --	0.171
Non-Black, >0-40 Drink-years	Comparison	658	123.94		
	Background RH	247	125.36	1.42 --	0.773
	Low RH	158	125.99	2.05 --	0.719
	High RH	158	124.17	0.23 --	0.969
	Low plus High RH	316	125.08	1.14 --	0.801
Non-Black, >40 Drink-years	Comparison	267	116.06		
	Background RH	82	122.35	6.29 --	0.423
	Low RH	59	109.81	-6.25 --	0.455
	High RH	59	118.77	2.71 --	0.761
	Low plus High RH	118	114.20	-1.86 --	0.779

^a Transformed from natural logarithm scale.

^b Difference of means after transformation to original scale; confidence interval on difference of means not presented because analysis was performed on natural logarithm scale.

^c P-value is based on difference of means on natural logarithm scale.

Note: Model 3: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, $10 \text{ ppt} < \text{Initial Dioxin} \leq 143$ ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table I-2-23.
Interaction Table for Creatine Kinase
(Discrete)

a) MODEL 1: RANCH HANDS VS. COMPARISONS — ADJUSTED (Group-by-Race: Table 13-34)						
Stratum	Occupational Category	Group	n	Percent High	Adj. Relative Risk (95% C.I.)	p-Value
<i>Non-Black</i>	<i>All</i>	<i>Ranch Hand Comparison</i>	<i>876 1,165</i>	<i>12.6 10.9</i>	<i>1.17 (0.89,1.54)</i>	<i>0.258</i>
<i>Black</i>	<i>All</i>	<i>Ranch Hand Comparison</i>	<i>53 70</i>	<i>39.6 61.4</i>	<i>0.38 (0.18,0.80)</i>	<i>0.011</i>
Non-Black	Officer	Ranch Hand Comparison	354 482	13.6 10.8	1.30 (0.85,1.97)	0.222
	Enlisted Flyer	Ranch Hand Comparison	149 181	10.7 9.9	0.88 (0.45,1.73)	0.715
	Enlisted Groundcrew	Ranch Hand Comparison	373 502	12.3 11.4	1.18 (0.79,1.75)	0.417
Black	Officer	Ranch Hand Comparison	7 6	28.6 50.0	0.43 (0.17,1.04)	0.062
	Enlisted Flyer	Ranch Hand Comparison	10 15	20.0 73.3	0.29 (0.11,0.76)	0.012
	Enlisted Groundcrew	Ranch Hand Comparison	36 49	47.2 59.2	0.39 (0.18,0.84)	0.017

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Race: Table 13-34)					
Stratum	Dioxin Category	n	Percent High	Adjusted Relative Risk (95% C.I.)^a	p-Value
Non-Black	Comparison	973	10.6		
	Background RH	347	12.1	1.26 (0.84,1.88)	0.268
	Low RH	231	9.5	0.84 (0.51,1.38)	0.497
	High RH	239	15.1	1.42 (0.92,2.20)	0.117
	Low plus High RH	470	12.3	1.12 (0.78,1.59)	0.539
Black	Comparison	52	67.3		
	Background RH	15	26.7	0.17 (0.05,0.67)	0.011
	Low RH	20	55.0	0.63 (0.21,1.93)	0.420
	High RH	12	33.3	0.20 (0.04,0.87)	0.032
	Low plus High RH	32	46.9	0.42 (0.16,1.10)	0.077

Table I-2-23. (Continued)
Interaction Table for Creatine Kinase
(Discrete)

c) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Lifetime Alcohol History: Table 13-34)					
Stratum	Dioxin Category	n	Percent High	Adjusted Relative Risk (95% C.I.) ^a	p-Value
0 Drink-years	Comparison	53	15.1		
	Background RH	20	10.0	0.72 (0.13,4.09)	0.712
	Low RH	15	13.3	1.27 (0.22,7.31)	0.789
	High RH	24	25.0	2.91 (0.75,11.32)	0.123
	Low plus High RH	39	20.5	2.13 (0.65,6.99)	0.214
>0-40 Drink-years	Comparison	696	13.9		
	Background RH	258	13.6	1.08 (0.69,1.68)	0.741
	Low RH	169	10.7	0.65 (0.37,1.14)	0.136
	High RH	164	14.6	1.14 (0.67,1.93)	0.631
	Low plus High RH	333	12.6	0.86 (0.57,1.30)	0.482
>40 Drink-years	Comparison	276	12.0		
	Background RH	84	10.7	1.17 (0.51,2.69)	0.717
	Low RH	67	19.4	1.42 (0.63,3.22)	0.397
	High RH	63	15.9	0.90 (0.37,2.19)	0.814
	Low plus High RH	130	17.7	1.15 (0.60,2.21)	0.678

^a Relative risk and confidence interval relative to Comparisons.

Note: Model 2: Low = 39-98 ppt; Medium = >98-232 ppt; High = >232 ppt.

Model 3: RH = Ranch Hand.

Comparison: Current Dioxin ≤10 ppt.

Background (Ranch Hand): Current Dioxin ≤10 ppt.

Low (Ranch Hand): Current Dioxin >10 ppt, 10 ppt < Initial Dioxin ≤143 ppt.

High (Ranch Hand): Current Dioxin >10 ppt, Initial Dioxin >143 ppt.

Table I-2-24.
Interaction Table for Serum Amylase
(Discrete)

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Age: Table 13-36)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Initial Dioxin)	
Stratum	Initial Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.) ^a	p-Value
Born ≥ 1942	Low	53	7.5	1.24 (0.65,2.37)	0.510
	Medium	69	0.0		
	High	111	3.6		
Born < 1942	Low	118	8.5	0.76 (0.47,1.23)	0.265
	Medium	98	7.1		
	High	59	8.5		

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Race: Table 13-36)					
Stratum	Dioxin Category	n	Percent High	Adjusted Relative Risk (95% C.I.) ^b	p-Value
Non-Black	Comparison	990	7.2		
	Background RH	354	6.2	0.70 (0.42,1.16)	0.161
	Low RH	236	6.4	0.94 (0.52,1.68)	0.827
	High RH	246	2.4	0.44 (0.18,1.05)	0.063
	Low plus High RH	482	4.4	0.71 (0.42,1.18)	0.186
Black	Comparison	53	20.8		
	Background RH	15	20.0	0.81 (0.19,3.49)	0.781
	Low RH	21	14.3	0.52 (0.12,2.14)	0.361
	High RH	12	50.0	3.82 (0.98,14.95)	0.054
	Low plus High RH	33	27.3	1.25 (0.44,3.56)	0.671

^a Relative risk for a twofold increase in initial dioxin.

^b Relative risk and confidence interval relative to Comparisons.

Note: Model 2: Low = 39-98 ppt; Medium = >98-232 ppt; High = >232 ppt.

Model 3: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table I-2-25.
Interaction Table for Serological Evidence of Prior Hepatitis B Infection

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Age: Table 13-38)					
Stratum	Dioxin Category	n	Percent Yes	Adjusted Relative Risk (95% C.I.)^a	p-Value
Born ≥ 1942	Comparison	448	13.4		
	Background RH	126	12.7	1.26 (0.68,2.33)	0.455
	Low RH	84	9.5	0.64 (0.29,1.41)	0.264
	High RH	150	10.7	0.65 (0.36,1.18)	0.159
	Low plus High RH	234	10.3	0.65 (0.39,1.07)	0.092
Born < 1942	Comparison	597	16.2		
	Background RH	241	7.9	0.56 (0.33,0.96)	0.034
	Low RH	170	10.0	0.55 (0.32,0.97)	0.038
	High RH	103	16.5	0.65 (0.36,1.17)	0.148
	Low plus High RH	273	12.5	0.59 (0.39,0.92)	0.019

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Occupation: Table 13-38)					
Stratum	Dioxin Category	n	Percent Yes	Adjusted Relative Risk (95% C.I.)^a	p-Value
Officer	Comparison	402	9.7		
	Background RH	233	6.4	0.67 (0.36,1.25)	0.205
	Low RH	102	2.9	0.25 (0.08,0.84)	0.024
	High RH	9	0.0	—	—
	Low plus High	111	2.7	0.23 (0.07,0.76)	0.016
Enlisted Flyer	Comparison	172	19.8		
	Background RH	38	5.3	0.26 (0.06,1.15)	0.076
	Low RH	55	10.9	0.49 (0.19,1.26)	0.139
	High RH	53	24.5	1.19 (0.57,2.51)	0.639
	Low plus High RH	108	17.6	0.82 (0.44,1.54)	0.536
Enlisted Groundcrew	Comparison	471	17.8		
	Background RH	96	18.8	1.08 (0.61,1.93)	0.783
	Low RH	97	16.5	0.87 (0.48,1.57)	0.635
	High RH	191	10.5	0.54 (0.32,0.92)	0.023
	Low plus High RH	288	12.5	0.65 (0.42,1.00)	0.050

Table I-2-25. (Continued)
Interaction Table for Serological Evidence of Prior Hepatitis B Infection

c) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Occupation: Table 13-38)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.) ^b	p-Value
Officer	Low	191	6.3	0.72 (0.41,1.23)	0.228
	Medium	139	4.3		
	High	14	0.0		
Enlisted Flyer	Low	30	3.3	1.73 (1.14,2.64)	0.011
	Medium	56	10.7		
	High	60	23.3		
Enlisted Groundcrew	Low	71	18.3	0.87 (0.72,1.06)	0.168
	Medium	97	16.5		
	High	216	11.6		

d) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Occupation: Table 13-38)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.) ^b	p-Value
Officer	Low	190	6.8	0.85 (0.58,1.24)	0.407
	Medium	134	3.7		
	High	20	0.0		
Enlisted Flyer	Low	32	3.1	1.56 (1.09,2.24)	0.016
	Medium	55	10.9		
	High	59	23.7		
Enlisted Groundcrew	Low	74	18.9	0.89 (0.75,1.04)	0.152
	Medium	101	13.9		
	High	209	12.4		

Table I-2-25. (Continued)
Interaction Table for Serological Evidence of Prior Hepatitis B Infection

e) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Occupation: Table 13-38)					
Current Dioxin Category Summary Statistics				Analysis Results for Log _e (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.) ^b	p-Value
Officer	Low	190	6.8	0.85 (0.58,1.25)	0.404
	Medium	134	3.7		
	High	20	0.0		
Enlisted Flyer	Low	31	3.2	1.55 (1.07,2.25)	0.021
	Medium	55	10.9		
	High	59	23.7		
Enlisted Groundcrew	Low	74	18.9	0.89 (0.75,1.05)	0.160
	Medium	101	13.9		
	High	209	12.4		

^a Relative risk and confidence interval relative to Comparisons.

^b Relative risk for a twofold increase in current dioxin.

--: Adjusted relative risk, confidence interval, and p-value not presented due to the sparse number of abnormalities.

Note: Model 3: RH = Ranch Hand.

Comparison: Current Dioxin ≤10 ppt.

Background (Ranch Hand): Current Dioxin ≤10 ppt.

Low (Ranch Hand): Current Dioxin >10 ppt, 10 ppt < Initial Dioxin ≤143 ppt.

High (Ranch Hand): Current Dioxin >10 ppt, Initial Dioxin >143 ppt.

Model 4: Low = ≤8.1 ppt; Medium = >8.1-20.5 ppt; High = >20.5 ppt.

Models 5 and 6: Low = ≤46 ppq; Medium = >46-128 ppq; High = >128 ppq.

Table I-2-26.
Interaction Table for Antibodies for Hepatitis C

a) MODEL 1: RANCH HANDS AND BY DIOXIN CATEGORY — ADJUSTED (Group-by-Age: Table 13-39)						
Stratum	Occupational Category	Group	n	Percent Yes	Adj. Relative Risk (95% C.I.)	p-Value
<i>Born ≥ 1942</i>	<i>All</i>	<i>Ranch Hand</i>	<i>396</i>	<i>1.8</i>	<i>1.09 (0.40,2.96)</i>	<i>0.865</i>
		<i>Comparison</i>	<i>559</i>	<i>1.6</i>		
<i>Born < 1942</i>	<i>All</i>	<i>Ranch Hand</i>	<i>556</i>	<i>0.2</i>	<i>0.09 (0.01,0.70)</i>	<i>0.021</i>
		<i>Comparison</i>	<i>721</i>	<i>1.9</i>		
Born ≥ 1942	Officer	Ranch Hand	79	2.5	--	--
		Comparison	121	0.0		
	Enlisted Flyer	Ranch Hand	38	0.0	--	--
		Comparison	58	0.0		
	Enlisted Groundcrew	Ranch Hand	279	1.8	0.93 (0.30,2.87)	0.902
		Comparison	380	2.4		
Born < 1942	Officer	Ranch Hand	288	0.4	0.18 (0.02,1.51)	0.114
		Comparison	381	1.8		
	Enlisted Flyer	Ranch Hand	124	0.0	--	--
		Comparison	144	2.8		
	Enlisted Groundcrew	Ranch Hand	144	0.0	--	--
		Comparison	196	1.5		

Table I-2-26. (Continued)
Interaction Table for Antibodies for Hepatitis C

b) MODEL 1: RANCH HANDS VS. COMPARISONS — ADJUSTED (Group-by-Degreasing Chemical Exposure: Table 13-39)						
Stratum	Occupational Category	Group	n	Percent Yes	Adj. Relative Risk (95% C.I.)	p-Value
<i>No</i>	<i>All</i>	<i>Ranch Hand</i>	<i>352</i>	<i>1.1</i>	<i>1.12 (0.30,4.20)</i>	<i>0.871</i>
		<i>Comparison</i>	<i>473</i>	<i>1.1</i>		
<i>Yes</i>	<i>All</i>	<i>Ranch Hand</i>	<i>600</i>	<i>0.7</i>	<i>0.29 (0.10,0.86)</i>	<i>0.025</i>
		<i>Comparison</i>	<i>807</i>	<i>2.2</i>		
<i>No</i>	<i>Officer</i>	<i>Ranch Hand</i>	<i>239</i>	<i>1.3</i>	<i>1.02 (0.22,4.76)</i>	<i>0.978</i>
		<i>Comparison</i>	<i>285</i>	<i>1.8</i>		
	<i>Enlisted Flyer</i>	<i>Ranch Hand</i>	<i>27</i>	<i>0.0</i>	<i>--</i>	<i>--</i>
		<i>Comparison</i>	<i>58</i>	<i>0.0</i>		
	<i>Enlisted Groundcrew</i>	<i>Ranch Hand</i>	<i>86</i>	<i>1.2</i>	<i>--</i>	<i>--</i>
		<i>Comparison</i>	<i>130</i>	<i>0.0</i>		
<i>Yes</i>	<i>Officer</i>	<i>Ranch Hand</i>	<i>128</i>	<i>0.0</i>	<i>--</i>	<i>--</i>
		<i>Comparison</i>	<i>217</i>	<i>0.9</i>		
	<i>Enlisted Flyer</i>	<i>Ranch Hand</i>	<i>135</i>	<i>0.0</i>	<i>--</i>	<i>--</i>
		<i>Comparison</i>	<i>144</i>	<i>2.8</i>		
	<i>Enlisted Groundcrew</i>	<i>Ranch Hand</i>	<i>337</i>	<i>1.2</i>	<i>0.41 (0.13,1.33)</i>	<i>0.139</i>
		<i>Comparison</i>	<i>446</i>	<i>2.7</i>		

--: Adjusted relative risk, confidence interval, and p-value not presented due to the sparse number of abnormalities.

Table I-2-27.
Interaction Table for Stool Hemoccult

a) MODEL 1: RANCH HANDS VS. COMPARISONS — ADJUSTED (Group-by-Lifetime Alcohol History: Table 13-40)						
Stratum	Occupational Category	Group	n	Percent Yes	Adj. Relative Risk (95% C.I.)	p-Value
0 Drink-years	All	<i>Ranch Hand</i>	57	1.8	0.64 (0.06,7.26)	0.718
		<i>Comparison</i>	67	3.0		
> 0-40 Drink-years	All	<i>Ranch Hand</i>	606	1.7	0.82 (0.38,1.80)	0.625
		<i>Comparison</i>	806	2.1		
> 40 Drink-years	All	<i>Ranch Hand</i>	213	5.2	4.40 (1.39,13.94)	0.012
		<i>Comparison</i>	308	1.3		
0 Drink-years	Officer	Ranch Hand	13	0.0	--	--
		Comparison	22	0.0		
	Enlisted Flyer	Ranch Hand	13	0.0	--	--
		Comparison	11	0.0		
	Enlisted Groundcrew	Ranch Hand	31	3.2	0.74 (0.06,8.75)	0.811
		Comparison	34	5.9		
> 0-40 Drink-years	Officer	Ranch Hand	245	2.0	0.84 (0.27,2.65)	0.770
		Comparison	324	1.5		
	Enlisted Flyer	Ranch Hand	91	0.0	--	--
		Comparison	117	1.7		
	Enlisted Groundcrew	Ranch Hand	270	1.9	0.94 (0.36,2.40)	0.890
		Comparison	365	2.7		
> 40 Drink-years	Officer	Ranch Hand	90	4.4	4.75 (1.21,18.73)	0.026
		Comparison	124	2.4		
	Enlisted Flyer	Ranch Hand	42	0.0	--	--
		Comparison	63	0.0		
	Enlisted Groundcrew	Ranch Hand	81	8.6	5.27 (1.37,20.27)	0.015
		Comparison	121	0.8		

--: Adjusted relative risk, confidence interval, and p-value not presented due to the sparse number of abnormalities.

Table I-2-28.
Interaction Table for Prealbumin (mg/dl)
(Continuous)

a) MODEL 1: RANCH HANDS VS. COMPARISONS — ADJUSTED (Group-by-Current Alcohol Use: Table 13-41)						
Stratum	Occupational Category	Group	n	Adjusted Mean	Difference of Adjusted Means (95% C.I.)	p-Value
0-1 Drinks/Day	All	Ranch Hand	719	27.49	-0.11 (-0.53,0.31)	0.622
		Comparison	980	27.60		
> 1-4 Drinks/Day	All	Ranch Hand	181	28.89	0.37 (-0.50,1.23)	0.407
		Comparison	213	28.53		
> 4 Drinks/Day	All	Ranch Hand	17	28.97	1.42 (-1.06,3.90)	0.262
		Comparison	39	27.55		
0-1 Drinks/Day	Officer	Ranch Hand	251	28.00	-0.01 (-0.71,0.69)	0.984
		Comparison	366	28.01		
	Enlisted Flyer	Ranch Hand	126	27.42	-0.16 (-1.20,0.87)	0.755
		Comparison	149	27.59		
	Enlisted Groundcrew	Ranch Hand	342	26.99	-0.15 (-0.76,0.46)	0.632
		Comparison	465	27.13		
> 1-4 Drinks/Day	Officer	Ranch Hand	99	28.84	0.21 (-0.97,1.40)	0.726
		Comparison	109	28.63		
	Enlisted Flyer	Ranch Hand	25	30.27	1.37 (-0.87,3.61)	0.230
		Comparison	35	28.90		
	Enlisted Groundcrew	Ranch Hand	57	28.59	0.25 (-1.28,1.78)	0.750
		Comparison	69	28.34		
> 4 Drinks/Day	Officer	Ranch Hand	7	30.13	1.44 (-2.63,5.50)	0.489
		Comparison	12	28.70		
	Enlisted Flyer	Ranch Hand	5	27.72	-0.11 (-4.27,4.50)	0.963
		Comparison	11	27.83		
	Enlisted Groundcrew	Ranch Hand	5	28.73	2.36 (-2.02,6.74)	0.291
		Comparison	16	26.37		

Table I-2-28. (Continued)
Interaction Table for Prealbumin (mg/dl)
(Continuous)

b) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Industrial Chemical Exposure: Table 13-41)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log₂ (Initial Dioxin)	
Stratum	Initial Dioxin	n	Adjusted Mean	Adjusted Slope (Std. Error)	p-Value
No	Low	73	27.17	0.4196 (0.2579)	0.104
	Medium	60	27.65		
	High	51	28.37		
Yes	Low	98	28.29	-0.3465 (0.1822)	0.058
	Medium	107	27.30		
	High	119	27.40		

c) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Industrial Chemical Exposure: Table 13-41)					
Stratum	Dioxin Category	n	Adjusted Mean	Difference of Adjusted Mean vs. Comparisons (95% C.I.)	p-Value
No	Comparison	416	27.75		
	Background RH	186	27.82	0.07 (-0.69,0.83)	0.855
	Low RH	104	27.03	-0.72 (-1.66,0.22)	0.134
	High RH	78	28.83	1.08 (-0.01,2.16)	0.052
	Low plus High RH	182	27.80	0.05 (-0.72,0.83)	0.896
Yes	Comparison	609	27.73		
	Background RH	176	27.30	-0.43 (-1.18,0.32)	0.260
	Low RH	147	28.36	0.63 (-0.16,1.42)	0.118
	High RH	173	27.51	-0.23 (-0.97,0.52)	0.555
	Low plus High RH	320	27.90	0.17 (-0.01,1.20)	0.052

Table I-2-28. (Continued)
Interaction Table for Prealbumin (mg/dl)
(Continuous)

d) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Industrial Chemical Exposure: Table 13-41)					
Current Dioxin Category Summary Statistics				Analysis Results for Log _e (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean	Adjusted Slope (Std. Error)	p-Value
No	Low	155	28.12	0.1388 (0.1772)	0.434
	Medium	122	27.17		
	High	91	28.30		
Yes	Low	132	28.06	-0.1199 (0.1331)	0.368
	Medium	168	28.05		
	High	196	27.31		

e) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Degreasing Chemical Exposure: Table 13-41)					
Current Dioxin Category Summary Statistics				Analysis Results for Log _e (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean	Adjusted Slope (Std. Error)	p-Value
No	Low	149	28.66	-0.4043 (0.1893)	0.033
	Medium	109	27.54		
	High	61	27.48		
Yes	Low	138	27.51	0.1527 (0.1310)	0.244
	Medium	181	27.68		
	High	226	27.51		

f) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Occupation: Table 13-41)					
Current Dioxin Category Summary Statistics				Analysis Results for Log _e (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean	Adjusted Slope (Std. Error)	p-Value
Officer	Low	186	27.87	0.4431 (0.2176)	0.042
	Medium	134	28.23		
	High	19	27.11		
Enlisted Flyer	Low	32	27.15	0.4033 (0.2504)	0.108
	Medium	55	28.21		
	High	59	28.24		
Enlisted Groundcrew	Low	72	27.95	-0.0019 (0.1258)	0.988
	Medium	101	27.11		
	High	206	27.64		

Table I-2-28. (Continued)
Interaction Table for Prealbumin (mg/dl)
(Continuous)

g) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Degreasing Chemical Exposure: Table 13-41)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean	Adjusted Slope (Std. Error)	p-Value
No	Low	143	28.41	-0.1656 (0.1648)	0.315
	Medium	115	27.94		
	High	61	27.37		
Yes	Low	147	27.18	0.3097 (0.1172)	0.008
	Medium	175	27.72		
	High	223	27.88		

h) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Industrial Chemical Exposure: Table 13-41)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean	Adjusted Slope (Std. Error)	p-Value
No	Low	149	28.21	0.0569 (0.1509)	0.706
	Medium	127	27.45		
	High	92	27.98		
Yes	Low	140	28.21	-0.2077 (0.1194)	0.082
	Medium	163	28.23		
	High	192	27.07		

i) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Degreasing Chemical Exposure: Table 13-41)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean	Adjusted Slope (Std. Error)	p-Value
No	Low	143	28.90	-0.4044 (0.1585)	0.011
	Medium	115	28.01		
	High	61	26.84		
Yes	Low	146	27.53	0.0483 (0.1180)	0.682
	Medium	175	27.73		
	High	223	27.33		

Note: Model 2: Low = 39-98 ppt; Medium = >98-232 ppt; High = >232 ppt.

Model 3: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Model 4: Low = ≤ 8.1 ppt; Medium = > 8.1-20.5 ppt; High = > 20.5 ppt.

Models 5 and 6: Low = ≤ 46 ppq; Medium = > 46-128 ppq; High = > 128 ppq.

Table I-2-29.
Interaction Table for Prealbumin
(Discrete)

a) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Occupation: Table 13-42)					
Current Dioxin Category Summary Statistics				Analysis Results for Log₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent Low	Adjusted Relative Risk (95% C.I.)^a	p-Value
Officer	Low	189	1.6	0.32 (0.14,0.74)	0.008
	Medium	140	0.7		
	High	14	0.0		
Enlisted Flyer	Low	31	3.2	0.29 (0.09,0.91)	0.033
	Medium	57	1.8		
	High	62	0.0		
Enlisted Groundcrew	Low	70	0.0	1.53 (0.86,2.72)	0.152
	Medium	101	1.0		
	High	220	1.8		

b) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Occupation: Table 13-42)					
Current Dioxin Category Summary Statistics				Analysis Results for Log₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent Low	Adjusted Relative Risk (95% C.I.)^a	p-Value
Officer	Low	188	1.6	0.51 (0.32,0.80)	0.003
	Medium	136	0.7		
	High	19	0.0		
Enlisted Flyer	Low	33	3.0	0.38 (0.18,0.83)	0.015
	Medium	56	1.8		
	High	61	0.0		
Enlisted Groundcrew	Low	73	0.0	1.47 (0.86,2.51)	0.162
	Medium	105	1.0		
	High	213	1.9		

Table I-2-29. (Continued)
Interaction Table for Prealbumin
(Discrete)

c) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Age: Table 13-42)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent Low	Adjusted Relative Risk (95% C.I.) ^a	p-Value
Born ≥ 1942	Low	101	0.0	2.05 (0.96,4.37)	0.062
	Medium	96	1.0		
	High	166	1.2		
Born < 1942	Low	192	1.6	0.69 (0.45,1.07)	0.099
	Medium	201	1.0		
	High	127	1.6		

^a Relative risk for a twofold increase in current dioxin.

Note: Model 4: Low = ≤8.1 ppt; Medium = >8.1-20.5 ppt; High = >20.5 ppt.

Models 5 and 6: Low = ≤46 ppq; Medium = >46-128 ppq; High = >128 ppq.

Table I-2-30.
Interaction Table for Albumin (mg/dl)
(Continuous)

a) MODEL 1: RANCH HANDS VS. COMPARISONS — ADJUSTED (Group-by-Age: Table 13-43)						
Stratum	Occupational Category	Group	n	Adjusted Mean	Difference of Adjusted Means (95% C.I.)	p-Value
<i>Born ≥ 1942</i>	<i>All</i>	<i>Ranch Hand</i>	382	3,949.54	<i>-30.94 (-70.93, 9.05)</i>	<i>0.130</i>
		<i>Comparison</i>	541	3,980.49		
<i>Born < 1942</i>	<i>All</i>	<i>Ranch Hand</i>	535	3,884.62	<i>2.17 (-32.28, 36.62)</i>	<i>0.902</i>
		<i>Comparison</i>	691	3,882.45		
Born ≥ 1942	Officer	Ranch Hand	77	3,965.68	-42.82 (-130.08, 44.44)	0.336
		Comparison	121	4,008.51		
	Enlisted Flyer	Ranch Hand	37	3,967.36	61.91 (-64.96, 188.78)	0.339
		Comparison	56	3,905.45		
	Enlisted Groundcrew	Ranch Hand	268	3,941.80	-40.15 (-88.31, 8.02)	0.102
		Comparison	364	3,981.94		
Born < 1942	Officer	Ranch Hand	280	3,873.77	-16.62 (-64.16, 30.92)	0.493
		Comparison	366	3,890.40		
	Enlisted Flyer	Ranch Hand	119	3,882.72	-26.15 (-100.92, 48.62)	0.493
		Comparison	139	3,908.86		
	Enlisted Groundcrew	Ranch Hand	136	3,910.51	61.64 (-5.91, 129.18)	0.074
		Comparison	186	3,848.88		

Table I-2-30. (Continued)
Interaction Table for Albumin (mg/dl)
(Continuous)

b) MODEL 1: RANCH HANDS VS. COMPARISONS — ADJUSTED (Group-by-Lifetime Alcohol History: Table 13-43)						
Stratum	Occupational Category	Group	n	Adjusted Mean	Difference of Adjusted Means (95% C.I.)	p-Value
0 Drink-years	All	Ranch Hand Comparison	63 69	3,915.09 3,835.91	79.18 (-24.30,182.67)	0.134
>0-40 Drink-years	All	Ranch Hand Comparison	625 840	3,916.10 3,923.75	-7.65 (39.04,23.73)	0.633
>40 Drink-years	All	Ranch Hand Comparison	229 323	3,896.63 3,940.59	-43.95 (-95.31,7.40)	0.094
0 Drink-years	Officer	Ranch Hand Comparison	14 23	3,919.68 3,894.62	25.06 (-176.74,226.86)	0.808
	Enlisted Flyer	Ranch Hand Comparison	14 11	4,040.51 3,854.07	186.44 (-52.83,425.71)	0.127
	Enlisted Groundcrew	Ranch Hand Comparison	35 35	3,863.85 3,793.50	70.34 (-71.79,212.48)	0.332
>0-40 Drink-years	Officer	Ranch Hand Comparison	248 337	3,922.00 3,934.92	-12.93 (-62.71,36.86)	0.611
	Enlisted Flyer	Ranch Hand Comparison	95 119	3,918.83 3,894.49	24.34 (-57.46,106.15)	0.560
	Enlisted Groundcrew	Ranch Hand Comparison	282 384	3,912.16 3,923.80	-11.64 (-58.24,34.96)	0.624
>40 Drink-years	Officer	Ranch Hand Comparison	95 127	3,912.52 3,971.31	-58.79 (-139.44,21.86)	0.153
	Enlisted Flyer	Ranch Hand Comparison	47 65	3,874.16 3,975.98	-101.81 (-215.62,12.00)	0.080
	Enlisted Groundcrew	Ranch Hand Comparison	87 131	3,895.34 3,898.92	-3.57 (-85.77,78.62)	0.932

Table I-2-30. (Continued)
Interaction Table for Albumin (mg/dl)
(Continuous)

c) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Industrial Chemical Exposure: Table 13-43)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Initial Dioxin)	
Stratum	Initial Dioxin	n	Adjusted Mean	Adjusted Slope (Std. Error)	p-Value
No	Low	75	3,805.39	44.1831 (17.9207)	0.014
	Medium	61	3,892.78		
	High	51	3,925.13		
Yes	Low	98	3,931.37	-9.3879 (12.7375)	0.461
	Medium	109	3,828.44		
	High	121	3,903.15		

d) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Industrial Chemical Exposure: Table 13-43)					
Stratum	Dioxin Category	n	Adjusted Mean	Difference of Adjusted Means vs. Comparisons (95% C.I.)	p-Value
No	Comparison	416	3,936.01		
	Background RH	188	3,928.25	-7.76 (-59.63,44.11)	0.769
	Low RH	105	3,870.60	-65.41 (-128.95,-1.88)	0.044
	High RH	79	4,020.49	84.48 (8.96,160.00)	0.028
	Low plus High RH	184	3,934.95	-1.06 (-62.27,60.16)	0.973
Yes	Comparison	611	3,933.77		
	Background RH	179	3,900.94	-32.83 (-83.49,17.82)	0.204
	Low RH	149	3,954.56	20.79 (-32.56,74.13)	0.445
	High RH	175	3,934.26	0.49 (-50.40,51.38)	0.985
	Low plus High RH	324	3,943.59	9.82 (-41.47,61.12)	0.707

Table I-2-30. (Continued)
Interaction Table for Albumin (mg/dl)
(Continuous)

e) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Current Alcohol Use: Table 13-43)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean	Adjusted Slope (Std. Error)	p-Value
0-1 Drinks/Day	Low	226	3,907.09	5.3704 (8.7818)	0.541
	Medium	220	3,872.26		
	High	240	3,927.07		
>1-4 Drinks/Day	Low	56	4,034.64	-34.1173 (19.8300)	0.086
	Medium	71	3,924.96		
	High	45	3,930.55		
>4 Drinks/Day	Low	7	3,961.80	-178.8045 (64.9326)	0.006
	Medium	4	3,893.56		
	High	6	3,629.82		

f) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Degreasing Chemical Exposure: Table 13-43)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean	Adjusted Slope (Std. Error)	p-Value
No	Low	149	3,976.82	-31.4753 (13.4453)	0.020
	Medium	111	3,864.52		
	High	62	3,910.16		
Yes	Low	140	3,876.02	8.4494 (9.2200)	0.360
	Medium	184	3,879.76		
	High	229	3,911.54		

Table I-2-30. (Continued)
Interaction Table for Albumin (mg/dl)
(Continuous)

g) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Current Alcohol Use: Table 13-43)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean	Adjusted Slope (Std. Error)	p-Value
0-1 Drinks/Day	Low	229	3,897.64	8.0534 (7.4504)	0.280
	Medium	222	3,887.12		
	High	235	3,926.45		
> 1-4 Drinks/Day	Low	57	4,045.51	-24.0586 (16.8150)	0.153
	Medium	68	3,920.09		
	High	47	3,930.73		
> 4 Drinks/Day	Low	6	4,074.80	-126.8478 (47.0410)	0.007
	Medium	5	3,847.74		
	High	6	3,598.09		

h) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Degreasing Chemical Exposure: Table 13-43)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean	Adjusted Slope (Std. Error)	p-Value
No	Low	143	3,968.69	-23.0042 (11.1454)	0.039
	Medium	117	3,900.71		
	High	62	3,877.96		
Yes	Low	149	3,879.33	11.3152 (7.9399)	0.155
	Medium	178	3,870.37		
	High	226	3,913.99		

Table I-2-30. (Continued)
Interaction Table for Albumin (mg/dl)
(Continuous)

i) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Current Alcohol Use: Table 13-43)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean	Adjusted Slope (Std. Error)	p-Value
0-1 Drinks/Day	Low	228	3,911.06	3.2706 (7.9638)	0.681
	Medium	222	3,893.22		
	High	235	3,919.26		
>1-4 Drinks/Day	Low	57	4,057.55	-29.6257 (17.0541)	0.083
	Medium	68	3,920.16		
	High	47	3,921.35		
>4 Drinks/Day	Low	6	4,064.51	-126.4062 (46.9979)	0.007
	Medium	5	3,831.75		
	High	6	3,590.84		

j) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Degreasing Chemical Exposure: Table 13-43)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean	Adjusted Slope (Std. Error)	p-Value
No	Low	143	3,984.02	-28.0614 (11.4260)	0.014
	Medium	117	3,905.30		
	High	62	3,869.66		
Yes	Low	148	3,890.13	6.4226 (8.4481)	0.447
	Medium	178	3,873.86		
	High	226	3,904.50		

Note: Model 2: Low = 39-98 ppt; Medium = >98-232 ppt; High = >232 ppt.

Model 3: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Model 4: Low = ≤ 8.1 ppt; Medium = > 8.1-20.5 ppt; High = > 20.5 ppt.

Models 5 and 6: Low = ≤ 46 ppq; Medium = > 46-128 ppq; High = > 128 ppq.

Table I-2-31.
Interaction Table for Albumin
(Discrete)

a) MODEL 1: RANCH HANDS VS. COMPARISONS — ADJUSTED (Group-by-Industrial Chemical Exposure: Table 13-44)						
Stratum	Occupational Category	Group	n	Percent Low	Adj. Relative Risk (95% C.I.)	p-Value
<i>No</i>	<i>All</i>	<i>Ranch Hand</i>	396	3.3	<i>2.39 (0.93,6.11)</i>	<i>0.069</i>
		<i>Comparison</i>	512	1.4		
<i>Yes</i>	<i>All</i>	<i>Reach Hand</i>	543	1.8	<i>0.64 (0.30,1.37)</i>	<i>0.249</i>
		<i>Comparison</i>	741	2.8		
<i>No</i>	Officer	Ranch Hand	226	3.1	2.48 (0.80,7.70)	0.117
		Comparison	305	1.6		
	Enlisted Flyer	Ranch Hand	46	4.4	1.24 (0.24,6.45)	0.798
		Comparison	62	0.0		
	Enlisted Groundcrew	Ranch Hand	124	3.2	3.02 (0.86,10.56)	0.084
		Comparison	145	1.4		
<i>Yes</i>	Officer	Ranch Hand	135	0.7	0.66 (0.17,2.55)	0.543
		Comparison	190	1.1		
	Enlisted Flyer	Ranch Hand	116	0.9	0.33 (0.08,1.40)	0.132
		Comparison	134	5.2		
	Enlisted Groundcrew	Ranch Hand	292	2.7	0.80 (0.33,1.94)	0.622
		Comparison	417	2.9		

Table I-2-32.
Interaction Table for α -1 Acid Glycoprotein (mg/dl)
(Continuous)

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Occupation: Table 13-45)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Initial Dioxin)	
Stratum	Initial Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
Officer	Low	76	51.23	0.0667 (0.0340)	0.050
	Medium	33	53.86		
	High	1	55.67		
Enlisted	Low	36	53.34	0.0103 (0.0185)	0.580
Flyer	Medium	43	54.36		
	High	29	55.48		
Enlisted	Low	58	58.33	-0.0244 (0.0090)	0.007
Groundcrew	Medium	89	57.62		
	High	137	55.22		

b) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Lifetime Alcohol History: Table 13-45)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Initial Dioxin)	
Stratum	Initial Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
0 Drink-years	Low	10	54.67	-0.0223 (0.0238)	0.348
	Medium	12	57.26		
	High	17	54.02		
>0-40 Drink-years	Low	119	53.16	-0.0086 (0.0096)	0.369
	Medium	107	55.20		
	High	107	52.81		
>40 Drink-years	Low	41	57.64	-0.0239 (0.0143)	0.096
	Medium	46	54.28		
	High	43	54.39		

Table I-2-32. (Continued)
Interaction Table for α -1 Acid Glycoprotein (mg/dl)
(Continuous)

c) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Lifetime Alcohol History: Table 13-45)					
Stratum	Dioxin Category	n	Adjusted Mean ^a	Difference of Adjusted Mean vs. Comparisons (95% C.I.) ^c	p-Value ^d
0 Drink-years	Comparison	53	51.42		
	Background RH	20	50.80	-0.62 --	0.831
	Low RH	15	58.51	7.09 --	0.042
	High RH	24	54.88	3.46 --	0.222
	Low plus High RH	39	56.25	4.83 --	0.050
>0-40 Drink-years	Comparison	696	54.29		
	Background RH	258	53.82	-0.46 --	0.594
	Low RH	169	54.27	-0.02 --	0.987
	High RH	164	54.78	0.49 --	0.644
	Low plus High RH	333	54.52	0.23 --	0.772
>40 Drink-years	Comparison	276	54.93		
	Background RH	84	54.89	-0.05 --	0.975
	Low RH	67	56.75	1.82 --	0.272
	High RH	63	53.61	-1.32 --	0.426
	Low plus High RH	130	55.21	0.28 --	0.829

Table I-2-32. (Continued)
Interaction Table for α -1 Acid Glycoprotein (mg/dl)
(Continuous)

d) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Lifetime Alcohol History: Table 13-45)					
Current Dioxin Category Summary Statistics				Analysis Results for \log_2 (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
0 Drink-years	Low	17	51.20	0.0056 (0.0167)	0.736
	Medium	18	55.85		
	High	24	54.39		
>0-40 Drink-years	Low	204	54.36	-0.0112 (0.0068)	0.102
	Medium	195	53.63		
	High	192	53.31		
>40 Drink-years	Low	66	54.69	-0.0105 (0.0100)	0.297
	Medium	77	55.37		
	High	71	52.50		

^a Transformed from natural logarithm scale.

^b Slope and standard error based on natural logarithm of α -1 acid glycoprotein versus \log_2 dioxin.

^c Difference of means after transformation to original scale; confidence interval on difference of means not presented because analysis was performed on natural logarithm scale.

^d P-value is based on difference of means on natural logarithm scale.

Note: Model 2: Low = 39-98 ppt; Medium = >98-232 ppt; High = >232 ppt.

Model 3: RH = Ranch Hand.

Comparison: Current Dioxin \leq 10 ppt.

Background (Ranch Hand): Current Dioxin \leq 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin \leq 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Model 4: Low = \leq 8.1 ppt; Medium = > 8.1-20.5 ppt; High = > 20.5 ppt.

Table I-2-33.
Interaction Table for α -1 Acid Glycoprotein
(Discrete)

a) MODEL 1: RANCH HANDS VS. COMPARISONS — ADJUSTED (Group-by-Age: Table 13-46)						
Stratum	Occupational Category	Group	n	Percent High	Adj. Relative Risk (95% C.I.)	p-Value
Born \geq 1942	All	<i>Ranch Hand</i>	382	2.6	2.00 (0.75,5.32)	0.165
		<i>Comparison</i>	541	1.3		
Born < 1942	All	<i>Ranch Hand</i>	535	2.1	0.51 (0.25,1.04)	0.065
		<i>Comparison</i>	691	3.9		
Born \geq 1942	Officer	<i>Ranch Hand</i>	77	0.0	1.71 (0.38,7.70)	0.488
		<i>Comparison</i>	121	1.7		
	Enlisted Flyer	<i>Ranch Hand</i>	37	2.7	3.35 (0.73,15.44)	0.121
		<i>Comparison</i>	56	1.8		
	Enlisted Groundcrew	<i>Ranch Hand</i>	268	3.4	1.85 (0.65,5.25)	0.245
		<i>Comparison</i>	364	1.1		
Born < 1942	Officer	<i>Ranch Hand</i>	280	1.8	0.40 (0.14,1.18)	0.097
		<i>Comparison</i>	366	3.0		
	Enlisted Flyer	<i>Ranch Hand</i>	119	4.2	0.79 (0.25,2.51)	0.691
		<i>Comparison</i>	139	4.3		
	Enlisted Groundcrew	<i>Ranch Hand</i>	136	0.7	0.44 (0.14,1.34)	0.148
		<i>Comparison</i>	186	5.4		

Table I-2-33. (Continued)
Interaction Table α -1 Acid for Glycoprotein
(Discrete)

b) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Occupation: Table 13-46)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log _e (Initial Dioxin)	
Stratum	Initial Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.) ^a	p-Value
Officer	Low	77	0.0	--	--
	Medium	33	0.0		
	High	1	0.0		
Enlisted Flyer	Low	36	0.0	2.75 (1.03,7.31)	0.043
	Medium	43	7.0		
	High	31	6.5		
Enlisted Groundcrew	Low	60	6.7	0.72 (0.36,1.44)	0.351
	Medium	94	1.1		
	High	140	1.4		

c) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Degreasing Chemical Exposure: Table 13-46)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log _e (Initial Dioxin)	
Stratum	Initial Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.) ^a	p-Value
No	Low	67	4.5	0.58 (0.21,1.58)	0.283
	Medium	46	4.3		
	High	32	0.0		
Yes	Low	106	0.9	1.53 (0.80,2.90)	0.195
	Medium	124	1.6		
	High	140	2.9		

Table I-2-33. (Continued)
Interaction Table for α -1 Acid Glycoprotein
(Discrete)

d) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Age: Table 13-46)					
Stratum	Dioxin Category	n	Percent High	Adjusted Relative Risk (95% C.I.)^b	p-Value
Born \geq 1942	Comparison	439	1.1		
	Background RH	125	0.8	0.63 (0.07,5.49)	0.674
	Low RH	82	6.1	5.32 (1.49,18.98)	0.010
	High RH	149	2.0	1.87 (0.43,8.03)	0.401
	Low plus High	231	3.5	3.16 (1.01,9.83)	0.048
Born < 1942	Comparison	586	3.8		
	Background RH	237	2.1	0.51 (0.19,1.34)	0.171
	Low RH	169	0.6	0.16 (0.02,1.22)	0.077
	High RH	102	2.9	0.78 (0.23,2.67)	0.687
	Low plus High RH	271	1.5	0.40 (0.13,1.17)	0.093

e) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Occupation: Table 13-46)					
Current Dioxin Category Summary Statistics				Analysis Results for Log₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.)^c	p-Value
Officer	Low	187	2.7	0.42 (0.19,0.93)	0.033
	Medium	138	0.0		
	High	14	0.0		
Enlisted Flyer	Low	30	0.0	2.25 (0.98,5.17)	0.056
	Medium	56	0.0		
	High	60	8.3		
Enlisted Groundcrew	Low	70	0.0	0.94 (0.60,1.45)	0.766
	Medium	96	6.3		
	High	213	0.9		

Table I-2-33. (Continued)
Interaction Table for α -1 Acid Glycoprotein
(Discrete)

f) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Occupation: Table 13-46)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.) ^c	p-Value
Officer	Low	186	2.7	0.62 (0.39,0.98)	0.043
	Medium	134	0.0		
	High	19	0.0		
Enlisted Flyer	Low	32	0.0	2.10 (1.01,4.34)	0.046
	Medium	55	0.0		
	High	59	8.5		
Enlisted Groundcrew	Low	72	0.0	0.96 (0.66,1.40)	0.834
	Medium	101	5.9		
	High	206	1.0		

g) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Occupation: Table 13-46)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.) ^c	p-Value
Officer	Low	186	2.7	0.63 (0.39,1.01)	0.053
	Medium	134	0.0		
	High	19	0.0		
Enlisted Flyer	Low	31	0.0	2.31 (1.06,5.03)	0.036
	Medium	55	0.0		
	High	59	8.5		
Enlisted GroundCrew	Low	72	0.0	1.00 (0.68,1.46)	0.980
	Medium	101	5.9		
	High	206	1.0		

^a Relative risk for a twofold increase in initial dioxin.

^b Relative risk and confidence interval relative to Comparisons.

^c Relative risk for a twofold increase in current dioxin.

Note: Model 2: Low = 39-98 ppt; Medium = >98-232 ppt; High = >232 ppt.

Model 3: RH = Ranch Hand.

Comparison: Current Dioxin ≤10 ppt.

Background (Ranch Hand): Current Dioxin ≤10 ppt.

Low (Ranch Hand): Current Dioxin >10 ppt, 10 ppt < Initial Dioxin ≤143 ppt.

High (Ranch Hand): Current Dioxin >10 ppt, Initial Dioxin >143 ppt.

Model 4: Low = ≤8.1 ppt; Medium = >8.1-20.5 ppt; High = >20.5 ppt.

Models 5 and 6: Low = ≤46 ppq; Medium = >46-128 ppq; High = >128 ppq.

Table I-2-34.
Interaction Table for α -1 Antitrypsin (mg/dl)
(Continuous)

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Industrial Chemical Exposure: Table 13-47)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Initial Dioxin)	
Stratum	Initial Dioxin	n	Adjusted Mean	Adjusted Slope (Std. Error)	p-Value
No	Low	72	142.91	-2.4852 (1.6706)	0.138
	Medium	60	152.17		
	High	50	135.71		
Yes	Low	98	141.76	1.1608 (1.1484)	0.313
	Medium	105	140.52		
	High	117	145.05		

b) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Degreasing Chemical Exposure: Table 13-47)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Initial Dioxin)	
Stratum	Initial Dioxin	n	Adjusted Mean	Adjusted Slope (Std. Error)	p-Value
No	Low	66	138.92	2.6547 (1.8262)	0.147
	Medium	46	146.87		
	High	31	145.13		
Yes	Low	104	145.01	-0.6819 (1.1146)	0.541
	Medium	119	145.44		
	High	136	143.70		

Table I-2-34. (Continued)
Interaction Table for α -1 Antitrypsin (mg/dl)
(Continuous)

c) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Occupation: Table 13-47)					
Current Dioxin Category Summary Statistics				Analysis Results for Log₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean	Adjusted Slope (Std. Error)	p-Value
Officer	Low	187	143.77	-5.0191 (1.7880)	0.005
	Medium	138	136.71		
	High	14	135.83		
Enlisted Flyer	Low	30	153.17	-2.2770 (1.7871)	0.203
	Medium	56	146.15		
	High	60	145.68		
Enlisted Groundcrew	Low	70	153.49	-1.2898 (0.8576)	0.133
	Medium	96	152.16		
	High	213	146.99		

d) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Degreasing Chemical Exposure: Table 13-47)					
Current Dioxin Category Summary Statistics				Analysis Results for Log₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean	Adjusted Slope (Std. Error)	p-Value
No	Low	149	147.46	-0.3926 (1.1954)	0.743
	Medium	109	142.29		
	High	61	144.93		
Yes	Low	138	153.38	-2.7376 (0.8138)	<0.001
	Medium	181	147.49		
	High	226	143.30		

Table I-2-34. (Continued)
Interaction Table for α -1 Antitrypsin (mg/dl)
(Continuous)

e) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Occupation: Table 13-47)					
Current Dioxin Category Summary Statistics				Analysis Results for Log₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean	Adjusted Slope (Std. Error)	p-Value
Officer	Low	186	144.19	-4.0222 (1.3046)	0.002
	Medium	134	135.79		
	High	19	139.87		
Enlisted Flyer	Low	32	155.03	-2.1960 (1.4904)	0.141
	Medium	55	143.09		
	High	59	147.31		
Enlisted Groundcrew	Low	72	153.60	-1.4504 (0.7536)	0.055
	Medium	101	150.51		
	High	206	147.85		

f) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Degreasing Chemical Exposure: Table 13-47)					
Current Dioxin Category Summary Statistics				Analysis Results for Log₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean	Adjusted Slope (Std. Error)	p-Value
No	Low	143	147.58	-0.6692 (0.9924)	0.500
	Medium	115	141.21		
	High	61	147.44		
Yes	Low	147	154.14	-2.7814 (0.6980)	<0.001
	Medium	175	145.92		
	High	223	144.79		

Table I-2-34. (Continued)
Interaction Table for α -1 Antitrypsin (mg/dl)
(Continuous)

g) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Occupation: Table 13-47)					
Current Dioxin Category Summary Statistics				Analysis Results for Log₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean	Adjusted Slope (Std. Error)	p-Value
Officer	Low	186	143.62	-3.7961 (1.3429)	0.005
	Medium	134	135.82		
	High	19	141.31		
Enlisted Flyer	Low	31	152.53	-0.4473 (1.6376)	0.785
	Medium	55	142.92		
	High	59	147.90		
Enlisted Groundcrew	Low	72	153.17	-1.3419 (0.7717)	0.082
	Medium	101	150.28		
	High	206	148.14		

h) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Degreasing Chemical Exposure: Table 13-47)					
Current Dioxin Category Summary Statistics				Analysis Results for Log₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean	Adjusted Slope (Std. Error)	p-Value
No	Low	143	146.75	-0.4414 (1.0178)	0.665
	Medium	115	140.91		
	High	61	147.86		
Yes	Low	146	153.19	-2.3285 (0.7419)	0.002
	Medium	175	145.83		
	High	223	145.32		

Note: Model 2: Low = 39-98 ppt; Medium = >98-232 ppt; High = >232 ppt.
 Model 4: Low = ≤8.1 ppt; Medium = >8.1-20.5 ppt; High = >20.5 ppt.
 Models 5 and 6: Low = ≤46 ppq; Medium = >46-128 ppq; High = >128 ppq.

Table I-2-35.
Interaction Table for α -2 Macroglobulin
(Continuous)

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Age: Table 13-49)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Initial Dioxin)	
Stratum	Initial Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
Born \geq 1942	Low	53	120.89	-0.0100 (0.0105)	0.338
	Medium	69	119.49		
	High	109	120.04		
Born < 1942	Low	117	125.27	0.0238 (0.0111)	0.032
	Medium	96	131.31		
	High	58	134.79		

^a Transformed from natural logarithm scale.

^b Slope and standard error based on natural logarithm of α -2 macroglobulin versus log₂ dioxin.

Note: Low = 39-98 ppt; Medium = >98-232 ppt; High = >232 ppt.

Table I-2-36.
Interaction Table for Apolipoprotein B
(Continuous)

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Age: Table 13-51)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Initial Dioxin)	
Stratum	Initial Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
Born ≥ 1942	Low	54	147.91	-0.0021 (0.0117)	0.856
	Medium	70	144.69		
	High	112	146.11		
Born < 1942	Low	119	147.63	0.0424 (0.0123)	<0.001
	Medium	100	149.32		
	High	60	162.95		

b) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Age: Table 13-51)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
Born ≥ 1942	Low	101	140.17	0.0143 (0.0069)	0.039
	Medium	96	147.14		
	High	166	145.20		
Born < 1942	Low	193	140.62	0.0360 (0.0072)	<0.001
	Medium	201	147.70		
	High	127	161.35		

^a Transformed from natural logarithm scale.

^b Slope and standard error based on natural logarithm of apolipoprotein B versus log₂ dioxin.

Note: Model 2: Low = 39-98 ppt; Medium = >98-232 ppt; High = >232 ppt.
 Models 5: Low = ≤46 ppq; Medium = >46-128 ppq; High = >128 ppq.

Table I-2-37.
Interaction Table for Apolipoprotein B
(Discrete)

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Age: Table 13-52)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Initial Dioxin)	
Stratum	Initial Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.) ^a	p-Value
Born ≥ 1942	Low	54	77.8	0.88 (0.71,1.10)	0.273
	Medium	70	72.9		
	High	112	70.5		
Born < 1942	Low	119	73.1	1.44 (1.05,1.97)	0.023
	Medium	100	77.0		
	High	60	86.7		

b) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Age: Table 13-52)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.) ^b	p-Value
Born ≥ 1942	Low	101	71.3	1.06 (0.93,1.20)	0.368
	Medium	96	76.0		
	High	166	71.7		
Born < 1942	Low	193	65.8	1.32 (1.15,1.51)	<0.001
	Medium	201	75.1		
	High	127	85.8		

^a Relative risk for a twofold increase in initial dioxin.

^b Relative risk for a twofold increase in current dioxin.

Note: Model 2: Low = 39-98 ppt; Medium = >98-232 ppt; High = >232 ppt.

Model 5: Low = ≤46 ppq; Medium = >46-128 ppq; High = >128 ppq.

Table I-2-38.
Interaction Table for C₃ Complement
(Continuous)

a) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Occupation: Table 13-53)					
Current Dioxin Category Summary Statistics				Analysis Results for Log₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean^a	Adjusted Slope (Std. Error)^b	p-Value
Officer	Low	188	111.68	0.0316 (0.0070)	<0.001
	Medium	136	115.48		
	High	19	130.65		
Enlisted Flyer	Low	33	109.00	0.0398 (0.0081)	<0.001
	Medium	56	112.02		
	High	61	120.58		
Enlisted Groundcrew	Low	73	113.75	0.0181 (0.0041)	<0.001
	Medium	105	119.87		
	High	213	121.57		

^a Transformed from natural logarithm scale.

^b Slope and standard error based on natural logarithm of C₃ complement versus log₂ dioxin.

Note: Low = ≤46 ppq; Medium = >46-128 ppq; High = >128 ppq.

Table I-2-39.
Interaction Table for C₃ Complement
(Discrete)

a) MODEL 1: RANCH HANDS VS. COMPARISONS — ADJUSTED (Group-by-Race: Table 13-54)						
Stratum	Occupational Category	Group	n	Percent Low	Adj. Relative Risk (95% C.I.)	p-Value
<i>Non-Black</i>	<i>All</i>	<i>Ranch Hand Comparison</i>	866 1,162	2.5 2.6	1.00 (0.57,1.76)	0.996
<i>Black</i>	<i>All</i>	<i>Ranch Hand Comparison</i>	51 70	3.9 0.0	--	--
Non-Black	Officer	Ranch Hand Comparison	350 481	2.6 3.3	0.83 (0.37,1.86)	0.648
	Enlisted Flyer	Ranch Hand Comparison	147 180	2.7 3.9	0.66 (0.19,2.33)	0.519
	Enlisted Groundcrew	Ranch Hand Comparison	369 501	2.4 1.4	1.79 (0.65,4.97)	0.260
Black	Officer	Ranch Hand Comparison	7 6	14.3 0.0	--	--
	Enlisted Flyer	Ranch Hand Comparison	9 15	0.0 0.0	--	--
	Enlisted Groundcrew	Ranch Hand Comparison	35 49	2.9 0.0	--	--

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Race: Table 13-54)					
Stratum	Dioxin Category	n	Percent Low	Adjusted Relative Risk (95% C.I.)^a	p-Value
Black	Comparison	52	0.0		
	Background RH	15	13.3	--	--
	Low RH	21	0.0	--	--
	High RH	12	0.0	--	--
	Low plus High RH	33	0.0	--	--
Non-Black	Comparison	975	2.9		
	Background RH	352	3.4	1.06 (0.52,2.17)	0.870
	Low RH	233	2.1	0.76 (0.29,2.05)	0.593
	High RH	242	1.2	0.39 (0.11,1.33)	0.132
	Low plus High RH	475	1.7	0.56 (0.25,1.28)	0.172

Table I-2-39. (Continued)
Interaction Table for C₃ Complement
(Discrete)

c) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Industrial Chemical Exposure: Table 13-54)					
Stratum	Dioxin Category	n	Percent Low	Adjusted Relative Risk (95% C.I.)^a	p-Value
No	Comparison	416	3.1		
	Background RH	188	2.7	0.74 (0.26,2.17)	0.588
	Low RH	105	4.8	1.59 (0.53,4.75)	0.407
	High RH	79	0.0	--	--
	Low plus High RH	184	2.7	0.76 (0.26,2.26)	0.625
Yes	Comparison	611	2.5		
	Background RH	179	5.0	1.93 (0.80,4.64)	0.143
	Low RH	149	0.0	--	--
	High RH	175	1.7	0.75 (0.21,2.73)	0.661
	Low plus High RH	324	0.9	0.40 (0.11,1.41)	0.153

d) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Current Alcohol Use: Table 13-54)					
Current Dioxin Category Summary Statistics				Analysis Results for Log₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent Low	Adjusted Relative Risk (95% C.I.)^b	p-Value
0-1 Drinks/Day	Low	226	4.0	0.51 (0.34,0.78)	0.002
	Medium	220	3.2		
	High	240	0.4		
> 1 Drinks/Day	Low	63	1.6	1.40 (0.81,2.44)	0.228
	Medium	75	0.0		
	High	51	7.8		

^a Relative risk and confidence interval relative to Comparisons.

^b Relative risk for a twofold increase in current dioxin.

--: Adjusted relative risk, confidence interval, and p-value not presented due to the sparse number of abnormalities.

Note: Model 3: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Model 4: Low = ≤ 8.1 ppt; Medium = > 8.1-20.5 ppt; High = > 20.5 ppt.

Table I-2-40.
Interaction Table for C₄ Complement (mg/dl)
(Continuous)

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Age: Table 13-55)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log₂ (Initial Dioxin)	
Stratum	Initial Dioxin	n	Adjusted Mean^a	Adjusted Slope (Std. Error)^b	p-Value
Born ≥ 1942	Low	53	22.16	0.0113 (0.0125)	0.365
	Medium	69	23.78		
	High	111	23.71		
Born < 1942	Low	118	22.72	-0.0117 (0.0139)	0.401
	Medium	98	23.34		
	High	59	22.83		

b) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Occupation: Table 13-55)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log₂ (Initial Dioxin)	
Stratum	Initial Dioxin	n	Adjusted Mean^a	Adjusted Slope (Std. Error)^b	p-Value
Officer	Low	77	21.97	0.1323 (0.0408)	0.001
	Medium	33	24.95		
	High	1	28.36		
Enlisted Flyer	Low	36	22.62	-0.0134 (0.0222)	0.547
	Medium	43	22.62		
	High	30	22.48		
Enlisted Groundcrew	Low	58	22.78	-0.0038 (0.0109)	0.726
	Medium	91	22.88		
	High	139	23.18		

Table I-2-40. (Continued)
Interaction Table for C₄ Complement (mg/dl)
(Continuous)

c) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Occupation: Table 13-55)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
Officer	Low	186	21.75	0.0369 (0.0116)	0.002
	Medium	134	22.25		
	High	19	27.63		
Enlisted Flyer	Low	32	21.60	0.0212 (0.0135)	0.117
	Medium	55	22.44		
	High	59	23.14		
Enlisted Groundcrew	Low	72	23.21	0.0024 (0.0068)	0.726
	Medium	101	23.14		
	High	206	23.04		

^a Transformed from natural logarithm scale.

^b Slope and standard error based on natural logarithm of C₄ complement versus log₂ dioxin.

Note: Model 2: Low = 39-98 ppt; Medium = >98-232 ppt; High = >232 ppt.
 Model 5: Low = ≤46 ppq; Medium = >46-128 ppq; High = >128 ppq.

Table I-2-41.
Interaction Table for Haptoglobin
(Continuous)

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Age: Table 13-57)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Initial Dioxin)	
Stratum	Initial Dioxin	n	Adjusted Mean	Adjusted Slope (Std. Error)	p-Value
Born ≥ 1942	Low	53	102.35	-4.7528 (2.3951)	0.048
	Medium	69	94.03		
	High	109	89.61		
Born < 1942	Low	117	100.89	2.3998 (2.5456)	0.346
	Medium	96	111.57		
	High	58	113.28		

b) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Lifetime Alcohol History: Table 13-57)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Initial Dioxin)	
Stratum	Initial Dioxin	n	Adjusted Mean	Adjusted Slope (Std. Error)	p-Value
0 Drink-years	Low	10	120.12	-4.0969 (5.0846)	0.421
	Medium	12	96.66		
	High	17	101.49		
>0-40 Drink-years	Low	119	96.57	-0.5802 (2.0963)	0.782
	Medium	107	103.80		
	High	107	99.30		
>40 Drink-years	Low	41	106.74	-1.8189 (3.0710)	0.554
	Medium	46	110.02		
	High	43	112.01		

Note: Low = 39-98 ppt; Medium = >98-232 ppt; High = >232 ppt.

Table I-2-42.
Interaction Table for Haptoglobin
(Discrete)

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Occupation: Table 13-58)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Initial Dioxin)	
Stratum	Initial Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.) ^a	p-Value
Officer	Low	76	5.3	4.51 (1.45,14.01)	0.009
	Medium	33	18.2		
	High	1	100.0		
Enlisted Flyer	Low	36	13.9	1.07 (0.66,1.74)	0.781
	Medium	43	16.3		
	High	29	20.7		
Enlisted Groundcrew	Low	58	10.3	0.91 (0.70,1.19)	0.500
	Medium	89	13.5		
	High	137	13.9		

b) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Lifetime Alcohol History: Table 13-58)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Initial Dioxin)	
Stratum	Initial Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.) ^a	p-Value
0 Drink-years	Low	10	20.0	0.84 (0.46,1.54)	0.577
	Medium	12	16.7		
	High	17	17.6		
>0-40 Drink-years	Low	119	5.9	1.19 (0.90,1.57)	0.229
	Medium	107	12.1		
	High	107	15.0		
>40 Drink-years	Low	41	14.6	0.78 (0.52,1.17)	0.238
	Medium	46	21.7		
	High	43	16.3		

^a Relative risk for a twofold increase in initial dioxin.

Note: Low = 39-98 ppt; Medium = >98-232 ppt; High = >232 ppt.

Table I-2-43.
Interaction Table for Transferrin
(Continuous)

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Occupation: Table 13-59)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Initial Dioxin)	
Stratum	Initial Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
Officer	Low	77	299.97	-0.0371 (0.0221)	0.094
	Medium	33	286.49		
	High	1	288.16		
Enlisted Flyer	Low	36	292.54	0.0186 (0.0120)	0.122
	Medium	43	289.48		
	High	30	301.81		
Enlisted Groundcrew	Low	58	292.64	0.0025 (0.0058)	0.664
	Medium	91	301.04		
	High	139	299.65		

b) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Industrial Chemical Exposure: Table 13-59)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Initial Dioxin)	
Stratum	Initial Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
No	Low	73	291.72	0.0148 (0.0086)	0.085
	Medium	60	294.72		
	High	51	302.52		
Yes	Low	98	298.44	-0.0015 (0.0059)	0.799
	Medium	107	294.98		
	High	119	297.91		

^a Transformed from natural logarithm scale.

^b Slope and standard error based on natural logarithm of transferrin versus log₂ dioxin.

Note: Low = 39-98 ppt; Medium = >98-232 ppt; High = >232 ppt.

Table I-2-44.
Interaction Table for Transferrin
(Discrete)

a) MODEL 1: RANCH HANDS VS. COMPARISONS — ADJUSTED (Group-by-Lifetime Alcohol History: Table 13-60)						
Stratum	Occupational Category	Group	n	Percent Low	Adj. Relative Risk (95% C.I.)	p-Value
0 Drink-years	All	Ranch Hand	63	14.3	0.92 (0.35,2.43)	0.867
		Comparison	69	15.9		
>0-40 Drink-years	All	Ranch Hand	625	12.2	0.97 (0.70,1.33)	0.829
		Comparison	840	12.5		
>40 Drink-years	All	Ranch Hand	229	10.9	0.53 (0.32,0.89)	0.016
		Comparison	323	17.3		
0 Drink-years	Officer	Ranch Hand	14	7.1	0.77 (0.27,2.20)	0.630
		Comparison	23	13.0		
	Enlisted Flyer	Ranch Hand	14	21.4	1.38 (0.46,4.16)	0.562
		Comparison	11	9.1		
	Enlisted Groundcrew	Ranch Hand	35	14.3	0.82 (0.30,2.26)	0.698
		Comparison	35	20.0		
>0-40 Drink-years	Officer	Ranch Hand	248	13.7	0.85 (0.55,1.33)	0.487
		Comparison	337	14.2		
	Enlisted Flyer	Ranch Hand	95	16.8	1.53 (0.81,2.90)	0.191
		Comparison	119	11.7		
	Enlisted Groundcrew	Ranch Hand	282	9.2	0.90 (0.57,1.42)	0.661
		Comparison	384	11.2		
>40 Drink-years	Officer	Ranch Hand	95	8.4	0.45 (0.16,1.29)	0.136
		Comparison	127	18.1		
	Enlisted Flyer	Ranch Hand	47	14.9	0.81 (0.39,1.66)	0.562
		Comparison	65	18.5		
	Enlisted Groundcrew	Ranch Hand	87	11.5	0.48 (0.26,0.88)	0.018
		Comparison	131	16.0		

Table I-2-44. (Continued)
Interaction Table for Transferrin
(Discrete)

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Lifetime Alcohol History: Table 13-60)					
Stratum	Dioxin Category	n	Percent Low	Adjusted Relative Risk (95% C.I.)^a	p-Value
0 Drink-years	Comparison	53	18.9		
	Background RH	20	15.0	0.73 (0.17,3.08)	0.664
	Low RH	15	20.0	1.13 (0.26,4.92)	0.868
	High RH	24	12.5	0.68 (0.16,2.86)	0.599
	Low plus High RH	39	15.4	0.85 (0.27,2.68)	0.787
>0-40 Drink-years	Comparison	696	12.6		
	Background RH	258	15.5	1.21 (0.79,1.83)	0.379
	Low RH	169	10.7	0.77 (0.44,1.32)	0.337
	High RH	164	7.9	0.68 (0.37,1.27)	0.224
	Low plus High RH	333	9.3	0.73 (0.47,1.13)	0.155
>40 Drink-years	Comparison	276	18.5		
	Background RH	84	9.5	0.45 (0.20,1.01)	0.053
	Low RH	67	9.0	0.37 (0.15,0.91)	0.031
	High RH	63	11.1	0.52 (0.22,1.24)	0.139
	Low plus High RH	130	10.0	0.44 (0.22,0.85)	0.014

^a Relative risk and confidence interval relative to Comparisons.

Note: Model 3: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, $10 \text{ ppt} < \text{Initial Dioxin} \leq 143$ ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

APPENDIX I-3.

Gastrointestinal Analysis Tables Occupation Removed from Final Model

This appendix contains results of exposure analyses after occupation has been removed from those final dioxin models (Models 2 through 6) that contained occupation. These analyses are performed to investigate the relationship of the dependent variable to dioxin without removing any effects due to occupation. The format of these tables closely parallels the adjusted panels of Chapter 13 tables. A summary of the tables found in this appendix follows.

Appendix I-3 Table	Chapter 13 Table	Dependent Variable
I-3-1	13-4	Jaundice
I-3-2	13-6	Alcohol-Related Chronic Liver Disease and Cirrhosis
I-3-3	13-9	Other Liver Disorders
I-3-4	13-10	Hepatomegaly
I-3-5	13-12	AST (Continuous)
I-3-6	13-13	AST (Discrete)
I-3-7	13-14	ALT (Continuous)
I-3-8	13-15	ALT (Discrete)
I-3-9	13-16	GGT (Continuous)
I-3-10	13-18	Alkaline Phosphatase (Continuous)
I-3-11	13-19	Alkaline Phosphatase (Discrete)
I-3-12	13-20	Total Bilirubin (Continuous)
I-3-13	13-22	Direct Bilirubin
I-3-14	13-23	Lactic Dehydrogenase (LDH) (Continuous)
I-3-15	13-24	Lactic Dehydrogenase (LDH) (Discrete)
I-3-16	13-25	Cholesterol (Continuous)
I-3-17	13-26	Cholesterol (Discrete)
I-3-18	13-27	HDL Cholesterol (Continuous)
I-3-19	13-29	Cholesterol-HDL Ratio (Continuous)
I-3-20	13-30	Cholesterol-HDL Ratio (Discrete)
I-3-21	13-31	Triglycerides (Continuous)

Appendix I-3 Table	Chapter 13 Table	Dependent Variable
I-3-22	13-32	Triglycerides (Discrete)
I-3-23	13-33	Creatine Kinase (Continuous)
I-3-24	13-34	Creatine Kinase (Discrete)
I-3-25	13-35	Serum Amylase (Continuous)
I-3-26	13-36	Serum Amylase (Discrete)
I-3-27	13-37	Antibodies for Hepatitis A
I-3-28	13-38	Serological Evidence of Prior Hepatitis B Infection
I-3-29	13-40	Stool Hemocult
I-3-30	13-41	Prealbumin (Continuous)
I-3-31	13-43	Albumin (Continuous)
I-3-32	13-45	α -1 Acid Glycoprotein (Continuous)
I-3-33	13-46	α -1 Acid Glycoprotein (Discrete)
I-3-34	13-47	α -1 Antitrypsin (Continuous)
I-3-35	13-48	α -1 Antitrypsin (Discrete)
I-3-36	13-49	α -2 Macroglobulin (Continuous)
I-3-37	13-50	α -2 Macroglobulin (Discrete)
I-3-38	13-51	Apolipoprotein B (Continuous)
I-3-39	13-52	Apolipoprotein B (Discrete)
I-3-40	13-53	C ₃ Complement (Continuous)
I-3-41	13-54	C ₃ Complement (Discrete)
I-3-42	13-55	C ₄ Complement (Continuous)
I-3-43	13-56	C ₄ Complement (Discrete)
I-3-44	13-57	Haptoglobin (Continuous)
I-3-45	13-58	Haptoglobin (Discrete)
I-3-46	13-59	Transferrin (Continuous)
I-3-47	13-60	Transferrin (Discrete)

Table I-3-1.
Analysis of Jaundice
Occupation Removed from Final Model

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED				
Dioxin Category	n	Adj. Relative Risk (95% C.I.)^{ab}	p-Value	Covariate Remarks
Comparison	1,035			AGE (p=0.021) DC (p=0.115)
Background RH	363	1.36 (0.69,2.70)	0.374	
Low RH	253	0.13 (0.02,0.96)	0.046	
High RH	254	0.27 (0.06,1.16)	0.078	
Low plus High RH	507	0.20 (0.06,0.66)	0.008	

^a Relative risk and confidence interval relative to Comparisons.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

Note: RH = Ranch Hand.

Comparison: Current Dioxin \leq 10 ppt.

Background (Ranch Hand): Current Dioxin \leq 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin \leq 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table I-3-2.
Analysis of Chronic Liver Disease and Cirrhosis (Alcohol-Related)
Occupation Removed from Final Model

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED				
Dioxin Category	n	Adj. Relative Risk (95% C.I.)^{ab}	p-Value	Covariate Remarks
Comparison	987			DXCAT*RACE (p=0.017) AGE*DRKYR (p=0.054)
Background RH	347	0.95 (0.55,1.67)**	0.869**	
Low RH	239	0.87 (0.46,1.63)**	0.656**	
High RH	228	0.84 (0.43,1.63)**	0.602**	
Low plus High RH	467	0.85 (0.52,1.40)**	0.529**	

^a Relative risk and confidence interval relative to Comparisons.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

** Categorized dioxin-by-covariate interaction ($p \leq 0.05$); adjusted relative risk, confidence interval, and p-value derived from a model fitted after deletion of this interaction; refer to Appendix Table 1-4-1 for further analysis of this interaction.

Note: RH = Ranch Hand.

Comparison: Current Dioxin \leq 10 ppt.

Background (Ranch Hand): Current Dioxin \leq 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin \leq 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table I-3-3.
Analysis of Other Liver Disorders
Occupation Removed from Final Model

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED			
Analysis Results for Log_e (Initial Dioxin)^a			
n	Adj. Relative Risk (95% C.I.)^b	p-Value	Covariate Remarks
519	1.10 (0.95,1.28)	0.203	AGE (p=0.444) RACE (p=0.003)

^a Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^b Relative risk for a twofold increase in initial dioxin.

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED				
Dioxin Category	n	Adj. Relative Risk (95% C.I.)^{ab}	p-Value	Covariate Remarks
Comparison	1,036			AGE (p=0.803) RACE (p<0.001) DC (p=0.337) DRKYR (p=0.001)
Background RH	365	0.99 (0.75,1.31)	0.927	
Low RH	253	1.02 (0.75,1.39)	0.917	
High RH	253	1.31 (0.97,1.78)	0.077	
Low plus High RH	506	1.16 (0.91,1.46)	0.225	

^a Relative risk and confidence interval relative to Comparisons.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

Note: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table I-3-3. (Continued)
Analysis of Other Liver Disorders
Occupation Removed from Final Model

c) MODELS 4, 5, AND 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED				
Model ^a	Analysis Results for Log ₂ (Current Dioxin + 1)			
	n	Adj. Relative Risk (95% C.I.) ^b	p-Value	Covariate Remarks
4	871	1.14 (1.03,1.27)**	0.013**	CURR*DC (p=0.015) AGE (p=0.999) RACE (p=0.051) DRKYR (p=0.039)
5	871	1.14 (1.04,1.25)**	0.005**	CURR*DC (p=0.018) AGE (p=0.980) RACE (p=0.048) DRKYR (p=0.040)
6 ^c	870	1.10 (1.00,1.21)**	0.056**	CURR*DC (p=0.017) AGE (p=0.832) RACE (p=0.037) DRKYR (p=0.045)

^a Model 4: Log₂ (lipid-adjusted current dioxin + 1).

Model 5: Log₂ (whole-weight current dioxin + 1).

Model 6: Log₂ (whole-weight current dioxin + 1), adjusted for log₂ total lipids.

^b Relative risk for a twofold increase in current dioxin.

^c Adjusted for log₂ total lipids in addition to covariates specified under "Covariate Remarks" column.

** Log₂ (current dioxin + 1)-by-covariate interaction (p ≤ 0.01); adjusted relative risk, confidence interval, and p-value derived from a model fitted after deletion of this interaction; refer to Appendix Table I-4-2 for further analysis of this interaction.

Table I-3-4.
Analysis of Hepatomegaly
Occupation Removed from Final Model

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED			
Analysis Results for Log₂ (Initial Dioxin)^a			
n	Adj. Relative Risk (95% C.I.)^b	p-Value	Covariate Remarks
506	1.12 (0.66,1.89)	0.675	AGE (p=0.008) DRKYR (p=0.058)

^a Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^b Relative risk for a twofold increase in initial dioxin.

b) MODELS 4, 5, AND 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED				
Analysis Results for Log₂ (Current Dioxin + 1)				
Model^a	n	Adj. Relative Risk (95% C.I.)^b	p-Value	Covariate Remarks
4	873	1.08 (0.74,1.59)	0.684	AGE (p=0.016) DRKYR (p=0.065)
5	873	1.00 (0.73,1.38)	0.988	AGE (p=0.040) DRKYR (p=0.031)
6 ^c	872	1.04 (0.72,1.50)	0.831	AGE (p=0.017) DRKYR (p=0.063)

^a Model 4: Log₂ (lipid-adjusted current dioxin + 1).

Model 5: Log₂ (whole-weight current dioxin + 1).

Model 6: Log₂ (whole-weight current dioxin + 1), adjusted for log₂ total lipids.

^b Relative risk for a twofold increase in current dioxin.

^c Adjusted for log₂ total lipids in addition to covariates specified under "Covariate Remarks" column.

Table I-3-5.
Analysis of AST (U/L)
(Continuous)
Occupation Removed from Final Model

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED						
Initial Dioxin Category Summary Statistics			Analysis Results for Log ₂ (Initial Dioxin) ^b			
Initial Dioxin	n	Adj. Mean ^{ab}	R ²	Adj. Slope (Std. Error) ^c	p-Value	Covariate Remarks
Low	171	22.36**	0.079	0.0130 (0.0124)**	0.294**	INIT*ALC (p=0.006) DC (p=0.267) ALC*IC (p=0.002)
Medium	167	23.30**				
High	170	23.37**				

^a Transformed from natural logarithm scale.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^c Slope and standard error based on natural logarithm of AST versus log₂ (initial dioxin).

** Log₂ (initial dioxin)-by-covariate interaction (p ≤ 0.05); adjusted mean, adjusted slope, standard error, and p-value derived from a model fitted after deletion of this interaction; refer to Appendix Table I-4-3 for further analysis of this interaction.

Note: Low = 39-98 ppt; Medium = >98-232 ppt; High = >232 ppt.

Table I-3-5. (Continued)
Analysis of AST (U/L)
(Continuous)
Occupation Removed from Final Model

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED					
Dioxin Category	n	Adj. Mean^{ab}	Difference of Adj. Mean vs. Comparisons (95% C.I.)^c	p-Value^d	Covariate Remarks
Comparison	1,025	23.50			DRKYR*DC (p=0.011) ALC*IC (p<0.001)
Background RH	362	23.20	-0.30 --	0.559	
Low RH	251	23.13	-0.37 --	0.529	
High RH	251	22.88	-0.62 --	0.298	
Low plus High RH	502	23.01	-0.50 --	0.280	

^a Transformed from natural logarithm scale.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^c Difference of adjusted means after transformation to original scale; confidence interval on difference of adjusted means not presented because analysis was performed on natural logarithm scale.

^d P-value is based on difference of means on natural logarithm scale.

Note: RH = Ranch Hand.

Comparison: Current Dioxin \leq 10 ppt.

Background (Ranch Hand): Current Dioxin \leq 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin \leq 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table I-3-5. (Continued)
Analysis of AST (U/L)
(Continuous)
Occupation Removed from Final Model

c) MODELS 4, 5, AND 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED							
Model ^b	Current Dioxin Category Adjusted Mean ^a /(n)			Analysis Results for Log ₂ (Current Dioxin + 1)			
	Low	Medium	High	R ²	Adj. Slope (Std. Error) ^c	p-Value	Covariate Remarks
4	22.52** (287)	23.65** (290)	22.70** (287)	0.069	0.0082 (0.0087)**	0.346**	CURR*ALC (p=0.003) AGE*DRKYR (p=0.030) ALC*IC (p<0.001) DRKYR*DC (p=0.009)
5	22.47** (290)	23.27** (290)	23.16** (284)	0.069	0.0089 (0.0074)**	0.231**	CURR*ALC (p=0.003) AGE*DRKYR (p=0.030) ALC*IC (p<0.001) DRKYR*DC (p=0.009)
6 ^d	22.61** (289)	23.30** (290)	22.98** (284)	0.071	0.0060 (0.0080)**	0.452**	CURR*ALC (p=0.003) AGE*DRKYR (p=0.024) ALC*IC (p<0.001) DRKYR*DC (p=0.008)

^a Transformed from natural logarithm scale.

^b Model 4: Log₂ (lipid-adjusted current dioxin + 1).

Model 5: Log₂ (whole-weight current dioxin + 1).

Model 6: Log₂ (whole-weight current dioxin + 1), adjusted for log₂ total lipids.

^c Slope and standard error based on natural logarithm of AST versus log₂ (current dioxin + 1).

^d Adjusted for log₂ total lipids in addition to covariates specified under "Covariate Remarks" column.

** Log₂ (current dioxin + 1)-by-covariate interaction (p≤0.05); adjusted mean, adjusted slope, standard error, and p-value derived from a model fitted after deletion of this interaction; refer to Appendix Table I-4-3 for further analysis of this interaction.

Note: Model 4: Low = ≤ 8.1 ppt; Medium = >8.1-20.5 ppt; High = >20.5 ppt.

Models 5 and 6: Low = ≤ 46 ppq; Medium = >46-128 ppq; High = >128 ppq.

Table I-3-6.
Analysis of AST
(Discrete)
Occupation Removed from Final Model

a) MODELS 4, 5, AND 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED				
Model ^a	Analysis Results for Log ₂ (Current Dioxin + 1)			
	n	Adj. Relative Risk (95% C.I.) ^b	p-Value	Covariate Remarks
4	864	1.04 (0.76,1.42)**	0.803**	CURR*ALC (p=0.015) IC (p=0.041) DC (p=0.018) DRKYR (p=0.075)
5	864	1.07 (0.81,1.40)**	0.635**	CURR*ALC (p=0.032) IC (p=0.044) DC (p=0.025) DRKYR (p=0.072)
6 ^c	863	1.01 (0.75,1.35)**	0.953**	CURR*ALC (p=0.029) IC (p=0.049) DC (p=0.028) DRKYR (p=0.068)

^a Model 4: Log₂ (lipid-adjusted current dioxin + 1).

Model 5: Log₂ (whole-weight current dioxin + 1).

Model 6: Log₂ (whole-weight current dioxin + 1), adjusted for log₂ total lipids.

^b Relative risk for a twofold increase in current dioxin.

^c Adjusted for log₂ total lipids in addition to covariates specified under "Covariate Remarks" column.

** Log₂ (current dioxin + 1)-by-covariate interaction (p ≤ 0.01); adjusted relative risk, confidence interval, and p-values derived from a model fitted after deletion of this interaction; refer to Appendix Table I-4-4 for further analysis of this interaction.

Table I-3-7.
Analysis of ALT (U/L)
(Continuous)
Occupation Removed from Final Model

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED						
Initial Dioxin Category Summary Statistics			Analysis Results for Log ₂ (Initial Dioxin) ^b			
Initial Dioxin	n	Adj. Mean ^{ab}	R ²	Adj. Slope (Std. Error) ^c	p-Value	Covariate Remarks
Low	171	26.89	0.078	0.0062 (0.0161)	0.701	AGE (p<0.001)
Medium	167	28.30				ALC (p=0.004)
High	170	27.61				DC (p=0.266)

^a Transformed from natural logarithm scale.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^c Slope and standard error based on natural logarithm of ALT versus log₂ (initial dioxin).

Note: Low = 39-98 ppt; Medium = >98-232 ppt; High = >232 ppt.

Table I-3-7. (Continued)
Analysis of ALT (U/L)
(Continuous)
Occupation Removed from Final Model

b) MODELS 4, 5, AND 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED							
Model ^b	Current Dioxin Category Adjusted Mean ^a /(n)			Analysis Results for Log ₂ (Current Dioxin + 1)			
	Low	Medium	High	R ²	Adj. Slope (Std. Error) ^c	p-Value	Covariate Remarks
4	25.02 (289)	27.40 (295)	27.46 (291)	0.055	0.0338 (0.0108)	0.002	AGE (p<0.001) ALC (p=0.002) DC (p=0.105)
5	25.17 (292)	26.99 (295)	27.71 (288)	0.057	0.0316 (0.0092)	0.001	AGE (p<0.001) ALC (p=0.002) DC (p=0.121)
6 ^d	25.37 (291)	27.02 (295)	27.51 (288)	0.057	0.0289 (0.0100)	0.004	AGE (p<0.001) ALC (p=0.002) DC (p=0.117)

^a Transformed from natural logarithm scale.

^b Model 4: Log₂ (lipid-adjusted current dioxin + 1).

Model 5: Log₂ (whole-weight current dioxin + 1).

Model 6: Log₂ (whole-weight current dioxin + 1), adjusted for log₂ total lipids.

^c Slope and standard error based on natural logarithm of ALT versus log₂ (current dioxin + 1).

^d Adjusted for log₂ total lipids in addition to covariates specified under "Covariate Remarks" column.

Note: Model 4: Low = ≤ 8.1 ppt; Medium = >8.1-20.5 ppt; High = >20.5 ppt.

Models 5 and 6: Low = ≤ 46 ppq; Medium = >46-128 ppq; High = >128 ppq.

Table I-3-8.
Analysis of ALT
(Discrete)
Occupation Removed from Final Model

a) MODELS 4, 5, AND 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED				
Model ^a	Analysis Results for Log ₂ (Current Dioxin + 1)			
	n	Adj. Relative Risk (95% C.I.) ^b	p-Value	Covariate Remarks
4	875	1.14 (0.93,1.40)	0.220	AGE (p=0.389) DC (p=0.002) ALC (p=0.006)
5	875	1.14 (0.95,1.37)	0.166	AGE (p=0.389) DC (p=0.002) ALC (p=0.006)
6 ^c	874	1.11 (0.91,1.35)	0.316	AGE (p=0.348) DC (p=0.002) ALC (p=0.008)

^a Model 4: Log₂ (lipid-adjusted current dioxin + 1).
 Model 5: Log₂ (whole-weight current dioxin + 1).
 Model 6: Log₂ (whole-weight current dioxin + 1), adjusted for log₂ total lipids.

^b Relative risk for a twofold increase in current dioxin.

^c Adjusted for log₂ total lipids in addition to covariates specified under "Covariate Remarks" column.

Table I-3-9.
Analysis of GGT (U/L)
(Continuous)
Occupation Removed from Final Model

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED						
Initial Dioxin Category Summary Statistics			Analysis Results for Log ₂ (Initial Dioxin) ^b			
Initial Dioxin	n	Adj. Mean ^{ab}	R ²	Adj. Slope (Std. Error) ^c	p-Value	Covariate Remarks
Low	170	34.24**	0.098	0.0120 (0.0223)**	0.592**	INIT*DC (p=0.042) AGE*DRKYR (p=0.026) AGE*ALC (p=0.072)
Medium	165	36.96**				
High	167	35.94**				

^a Transformed from natural logarithm scale.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^c Slope and standard error based on natural logarithm of GGT versus log₂ (initial dioxin).

** Log₂ (initial dioxin)-by-covariate interaction ($p \leq 0.05$); adjusted mean, adjusted slope, standard error, and p-value derived from a model fitted after deletion of this interaction; refer to Appendix Table I-4-5 for further analysis of this interaction.

Note: Low = 39-98 ppt; Medium = >98-232 ppt; High = >232 ppt.

Table I-3-9. (Continued)
Analysis of GGT (U/L)
(Continuous)
Occupation Removed from Final Model

b) MODELS 4, 5, AND 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED							
Model ^b	Current Dioxin Category Adjusted Mean ^a /(n)			Analysis Results for Log ₂ (Current Dioxin + 1)			
	Low	Medium	High	R ²	Adj. Slope (Std. Error) ^c	p-Value	Covariate Remarks
4	29.37 (289)	33.29 (295)	35.64 (291)	0.079	0.0564 (0.0142)	<0.001	AGE (p=0.286) ALC (p=0.002)
5	29.08 (292)	32.87 (295)	36.56 (288)	0.087	0.0581 (0.0121)	<0.001	AGE (p=0.299) ALC (p<0.001)
6 ^d	32.16 (291)	34.96 (295)	37.10 (288)	0.108	0.0383 (0.0130)	0.003	AGE (p=0.154) RACE (p=0.113) ALC (p<0.001)

^a Transformed from natural logarithm scale.

^b Model 4: Log₂ (lipid-adjusted current dioxin + 1).

Model 5: Log₂ (whole-weight current dioxin + 1).

Model 6: Log₂ (whole-weight current dioxin + 1), adjusted for log₂ total lipids.

^c Slope and standard error based on natural logarithm of GGT versus log₂ (current dioxin + 1).

^d Adjusted for log₂ total lipids in addition to covariates specified under "Covariate Remarks" column.

Note: Model 4: Low = ≤ 8.1 ppt; Medium = >8.1-20.5 ppt; High = >20.5 ppt.

Models 5 and 6: Low = ≤ 46 ppq; Medium = >46-128 ppq; High = >128 ppq.

Table I-3-10.
Analysis of Alkaline Phosphatase (U/L)
(Continuous)
Occupation Removed from Final Model

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED						
Initial Dioxin Category Summary Statistics			Analysis Results for Log ₂ (Initial Dioxin) ^b			
Initial Dioxin	n	Adj. Mean ^{ab}	R ²	Adj. Slope (Std. Error) ^c	p-Value	Covariate Remarks
Low	173	70.19**	0.030	0.0023 (0.0084)**	0.779**	INIT*DC (p=0.009)
Medium	170	72.15**				
High	172	70.90**				

^a Transformed from natural logarithm scale.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^c Slope and standard error based on natural logarithm of alkaline phosphatase versus log₂ (initial dioxin).

** Log₂ (initial dioxin)-by-covariate interaction ($p \leq 0.05$); adjusted mean, adjusted slope, standard error, and p-value derived from a model fitted after deletion of this interaction; refer to Appendix Table I-4-6 for further analysis of this interaction.

Note: Low = 39-98 ppt; Medium = >98-232 ppt; High = >232 ppt.

Table I-3-10. (Continued)
Analysis of Alkaline Phosphatase (U/L)
(Continuous)
Occupation Removed from Final Model

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED					
Dioxin Category	n	Adj. Mean ^{ab}	Difference of Adj. Mean vs. Comparisons (95% C.I.) ^c	p-Value ^d	Covariate Remarks
Comparison	1,027	67.68**			DXCAT*DC (p=0.005) AGE (p=0.006) WINE (p=0.002) RACE*IC (p=0.002)
Background RH	366	69.05**	1.37 --**	0.201**	
Low RH	254	71.09**	3.42 --**	0.006**	
High RH	254	70.48**	2.81 --**	0.024**	
Low plus High RH	508	70.79**	3.11 --**	0.001**	

^a Transformed from natural logarithm scale.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^c Difference of adjusted means after transformation to original scale; confidence interval on difference of adjusted means not presented because analysis was performed on natural logarithm scale.

^d P-value is based on difference of means on natural logarithm scale.

** Categorized dioxin-by-covariate interaction ($p \leq 0.05$); adjusted mean, difference of adjusted means, confidence interval, and p-value derived from a model fitted after deletion of this interaction; refer to Appendix Table I-4-6 for further analysis of this interaction.

Note: RH = Ranch Hand.

Comparison: Current Dioxin \leq 10 ppt.

Background (Ranch Hand): Current Dioxin \leq 10 ppt.

Low (Ranch Hand): Current Dioxin $>$ 10 ppt, 10 ppt $<$ Initial Dioxin \leq 143 ppt.

High (Ranch Hand): Current Dioxin $>$ 10 ppt, Initial Dioxin $>$ 143 ppt.

Table I-3-10. (Continued)
Analysis of Alkaline Phosphatase (U/L)
(Continuous)
Occupation Removed from Final Model

c) MODELS 4, 5, AND 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED							
Model ^b	Current Dioxin Category Adjusted Mean ^a /(n)			Analysis Results for Log ₂ (Current Dioxin + 1)			
	Low	Medium	High	R ²	Adj. Slope (Std. Error) ^c	p-Value	Covariate Remarks
4	67.48 (287)	68.78 (291)	68.30 (289)	0.025	-0.0002 (0.0061)	0.974	AGE (p=0.433) LWINE (p=0.005) DC (p=0.002)
5	67.88** (290)	68.06** (291)	68.87** (286)	0.030	-0.0001 (0.0053)**	0.981**	CURR*RACE (p=0.039) AGE (p=0.494) LWINE (p=0.004) DC (p=0.002)
6 ^d	68.42** (289)	68.26** (291)	68.52** (286)	0.034	-0.0034 (0.0057)**	0.552**	CURR*RACE (p=0.036) AGE (p=0.652) LWINE (p=0.005) DC (p=0.003)

^a Transformed from natural logarithm scale.

^b Model 4: Log₂ (lipid-adjusted current dioxin + 1).

Model 5: Log₂ (whole-weight current dioxin + 1).

Model 6: Log₂ (whole-weight current dioxin + 1), adjusted for log₂ total lipids.

^c Slope and standard error based on natural logarithm of alkaline phosphatase versus log₂ (current dioxin + 1).

^d Adjusted for log₂ total lipids in addition to covariates specified under "Covariate Remarks" column.

** Log₂ (current dioxin + 1)-by-covariate interaction (p ≤ 0.05); adjusted mean, adjusted slope, standard error, and p-value derived from a model fitted after deletion of this interaction; refer to Appendix Table I-4-6 for further analysis of this interaction.

Note: Model 4: Low = ≤ 8.1 ppt; Medium = >8.1-20.5 ppt; High = >20.5 ppt.

Models 5 and 6: Low = ≤ 46 ppq; Medium = >46-128 ppq; High = >128 ppq.

Table I-3-11.
Analysis of Alkaline Phosphatase
(Discrete)
Occupation Removed from Final Model

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED			
Analysis Results for Log₂ (Initial Dioxin)^a			
n	Adj. Relative Risk (95% C.I.)^b	p-Value	Covariate Remarks
504	1.06 (0.77,1.45)	0.734	AGE (p=0.757) IC (p=0.033) LWINE (p=0.164)

^a Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^b Relative risk for a twofold increase in initial dioxin.

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED				
Dioxin Category	n	Adj. Relative Risk (95% C.I.)^{ab}	p-Value	Covariate Remarks
Comparison	1,043			AGE (p=0.111)
Background RH	369	1.63 (0.89,2.96)	0.111	
Low RH	257	1.80 (0.95,3.39)	0.070	
High RH	258	1.61 (0.81,3.21)	0.175	
Low plus High RH	515	1.71 (1.01,2.91)	0.047	

^a Relative risk and confidence interval relative to Comparisons.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

Note: RH = Ranch Hand.

Comparison: Current Dioxin \leq 10 ppt.

Background (Ranch Hand): Current Dioxin \leq 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin \leq 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table I-3-11. (Continued)
Analysis of Alkaline Phosphatase
(Discrete)
Occupation Removed from Final Model

c) MODELS 4, 5, AND 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED				
Model ^a	Analysis Results for Log ₂ (Current Dioxin + 1)			
	n	Adj. Relative Risk (95% C.I.) ^b	p-Value	Covariate Remarks
4	884	1.05 (0.85,1.29)	0.666	AGE (p=0.525)
5	884	1.04 (0.87,1.24)	0.692	AGE (p=0.534)
6 ^c	883	0.98 (0.81,1.19)	0.845	AGE (p=0.640)

^a Model 4: Log₂ (lipid-adjusted current dioxin + 1).

Model 5: Log₂ (whole-weight current dioxin + 1).

Model 6: Log₂ (whole-weight current dioxin + 1), adjusted for log₂ total lipids.

^b Relative risk for a twofold increase in current dioxin.

^c Adjusted for log₂ total lipids in addition to covariates specified under "Covariate Remarks" column.

Table I-3-12.
Analysis of Total Bilirubin (mg/dl)
(Continuous)
Occupation Removed from Final Model

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED					
Dioxin Category	n	Adj. Mean^{ab}	Difference of Adj. Mean vs. Comparisons (95% C.I.)^c	p-Value^d	Covariate Remarks
Comparison	1,027	0.63			AGE (p=0.060) ALC (p<0.001)
Background RH	367	0.63	0.01 --	0.745	
Low RH	254	0.62	-0.01 --	0.635	
High RH	254	0.60	-0.03 --	0.074	
Low plus High RH	508	0.61	-0.02 --	0.142	

^a Transformed from natural logarithm scale.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^c Difference of adjusted means after transformation to original scale; confidence interval on difference of adjusted means not presented because analysis was performed on natural logarithm scale.

^d P-value is based on difference of means on natural logarithm scale.

Note: RH = Ranch Hand.

Comparison: Current Dioxin \leq 10 ppt.

Background (Ranch Hand): Current Dioxin \leq 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin \leq 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table I-3-12. (Continued)
Analysis of Total Bilirubin (mg/dl)
(Continuous)
Occupation Removed from Final Model

b) MODELS 4, 5, AND 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED							
Model ^b	Current Dioxin Category Adjusted Mean ^a /(n)			Analysis Results for Log ₂ (Current Dioxin + 1)			
	Low	Medium	High	R ²	Adj. Slope (Std. Error) ^c	p-Value	Covariate Remarks
4	0.62 (290)	0.63 (298)	0.59 (296)	0.008	-0.0063 (0.0097)	0.514	DC (p=0.799) AGE*RACE (p=0.017)
5	0.62 (294)	0.62 (297)	0.60 (293)	0.007	-0.0025 (0.0081)	0.754	AGE*RACE (p=0.016)
6 ^d	0.63 (293)	0.62 (297)	0.60 (293)	0.010	-0.0076 (0.0088)	0.387	AGE*RACE (p=0.020)

^a Transformed from natural logarithm scale.

^b Model 4: Log₂ (lipid-adjusted current dioxin + 1).
 Model 5: Log₂ (whole-weight current dioxin + 1).
 Model 6: Log₂ (whole-weight current dioxin + 1), adjusted for log₂ total lipids.

^c Slope and standard error based on natural logarithm of total bilirubin versus log₂ (current dioxin + 1).

^d Adjusted for log₂ total lipids in addition to covariates specified under "Covariate Remarks" column.

Note: Model 4: Low = ≤ 8.1 ppt; Medium = >8.1-20.5 ppt; High = >20.5 ppt.
 Models 5 and 6: Low = ≤ 46 ppq; Medium = >46-128 ppq; High = >128 ppq.

Table I-3-13.
Analysis of Direct Bilirubin
Occupation Removed from Final Model

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED				
Dioxin Category	n	Adj. Relative Risk (95% C.I.) ^{ab}	p-Value	Covariate Remarks
Comparison	1,027			IC (p=0.028) RACE*AGE (p=0.065) AGE*ALC (p=0.034)
Background RH	367	0.76 (0.28,2.08)	0.599	
Low RH	254	0.65 (0.22,1.95)	0.442	
High RH	254	0.26 (0.06,1.17)	0.079	
Low plus High RH	508	0.44 (0.17,1.11)	0.083	

^a Relative risk and confidence interval relative to Comparisons.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

Note: RH = Ranch Hand.

Comparison: Current Dioxin \leq 10 ppt.

Background (Ranch Hand): Current Dioxin \leq 10 ppt.

Low (Ranch Hand): Current Dioxin $>$ 10 ppt, 10 ppt $<$ Initial Dioxin \leq 143 ppt.

High (Ranch Hand): Current Dioxin $>$ 10 ppt, Initial Dioxin $>$ 143 ppt.

Table I-3-13. (Continued)
Analysis of Direct Bilirubin
Occupation Removed from Final Model

b) MODELS 4, 5, AND 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED				
Model ^a	Analysis Results for Log ₂ (Current Dioxin + 1)			
	n	Adj. Relative Risk (95% C.I.) ^b	p-Value	Covariate Remarks
4	864	0.86 (0.56,1.31)	0.469	DRKYR (p=0.135)
5	864	0.99 (0.71,1.39)	0.958	DRKYR (p=0.142)
6 ^c	863	0.70 (0.49,1.01)	0.065	DRKYR (p=0.107)

^a Model 4: Log₂ (lipid-adjusted current dioxin + 1).

Model 5: Log₂ (whole-weight current dioxin + 1).

Model 6: Log₂ (whole-weight current dioxin + 1), adjusted for log₂ total lipids.

^b Relative risk for a twofold increase in current dioxin.

^c Adjusted for log₂ total lipids in addition to covariates specified under "Covariate Remarks" column.

Table I-3-14.
Analysis of LDH (U/L)
(Continuous)
Occupation Removed from Final Model

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED						
Initial Dioxin Category Summary Statistics			Analysis Results for Log ₂ (Initial Dioxin) ^b			
Initial Dioxin	n	Adj. Mean ^{ab}	R ²	Adj. Slope (Std. Error) ^c	p-Value	Covariate Remarks
Low	171	146.70	0.021	0.0032 (0.0058)	0.586	RACE*ALC (p=0.024)
Medium	167	143.47				
High	170	148.40				

^a Transformed from natural logarithm scale.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^c Slope and standard error based on natural logarithm of LDH versus log₂ (initial dioxin).

Note: Low = 39-98 ppt; Medium = >98-232 ppt; High = >232 ppt.

Table I-3-14. (Continued)
Analysis of LDH (U/L)
(Continuous)
Occupation Removed from Final Model

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED					
Dioxin Category	n	Adj. Mean^{ab}	Difference of Adj. Mean vs. Comparisons (95% C.I.)^c	p-Value^d	Covariate Remarks
Comparison	1,024	148.25**			DXCAT*AGE (p=0.006) DXCAT*RACE (p=0.035) DXCAT*DRKYR (p=0.044)
Background RH	362	147.74**	-0.51 --**	0.754**	
Low RH	251	148.08**	-0.17 --**	0.927**	
High RH	251	148.70**	0.45 --**	0.809**	
Low plus High RH	502	148.39**	0.14 --**	0.922**	

^a Transformed from natural logarithm scale.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^c Difference of adjusted means after transformation to original scale; confidence interval on difference of adjusted means not presented because analysis was performed on natural logarithm scale.

^d P-value is based on difference of means on natural logarithm scale.

** Categorized dioxin-by-covariate interactions ($p \leq 0.05$); adjusted mean, difference of adjusted means, confidence interval, and p-value derived from a model fitted after deletion of these interactions; refer to Appendix Table I-4-7 for further analysis of these interactions.

Note: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, $10 \text{ ppt} < \text{Initial Dioxin} \leq 143$ ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table I-3-14. (Continued)
Analysis of LDH (U/L)
(Continuous)
Occupation Removed from Final Model

c) MODELS 4, 5, AND 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED							
Model ^b	Current Dioxin Category Adjusted Mean ^a /(n)			Analysis Results for Log ₂ (Current Dioxin + 1)			
	Low	Medium	High	R ²	Adj. Slope (Std. Error) ^c	p-Value	Covariate Remarks
4	143.99 (289)	146.76 (295)	145.07 (291)	0.012	0.0037 (0.0033)	0.254	ALC*DC (p=0.020)
5	143.86 (292)	146.23 (295)	145.81 (288)	0.012	0.0037 (0.0034)	0.279	ALC*DC (p=0.021)
6 ^d	144.02 (291)	146.24 (295)	145.65 (288)	0.012	0.0032 (0.0037)	0.388	ALC*DC (p=0.022)

^a Transformed from natural logarithm scale.

^b Model 4: Log₂ (lipid-adjusted current dioxin + 1).

Model 5: Log₂ (whole-weight current dioxin + 1).

Model 6: Log₂ (whole-weight current dioxin + 1), adjusted for log₂ total lipids.

^c Slope and standard error based on natural logarithm of LDH versus log₂ (current dioxin + 1).

^d Adjusted for log₂ total lipids in addition to covariates specified under "Covariate Remarks" column.

Note: Model 4: Low = ≤ 8.1 ppt; Medium = >8.1-20.5 ppt; High = >20.5 ppt.

Models 5 and 6: Low = ≤ 46 ppq; Medium = >46-128 ppq; High = >128 ppq.

Table I-3-15.
Analysis of LDH
(Discrete)
Occupation Removed from Final Model

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED				
Dioxin Category	n	Adj. Relative Risk (95% C.I.)^{ab}	p-Value	Covariate Remarks
Comparison	1,024			DXCAT*DRKYR (p=0.008) RACE (p=0.003) AGE (p=0.131) ALC (p=0.004) DC (p=0.195)
Background RH	362	1.06 (0.74,1.52)**	0.757**	
Low RH	251	0.80 (0.53,1.23)**	0.315**	
High RH	251	1.08 (0.73,1.61)**	0.691**	
Low plus High RH	502	0.94 (0.69,1.29)**	0.695**	

^a Relative risk and confidence interval relative to Comparisons.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

** Categorized dioxin-by-covariate interaction ($p \leq 0.05$); adjusted relative risk, confidence interval, and p-value derived from a model fitted after deletion of this interaction; refer to Appendix Table I-4-8 for further analysis of this interaction.

Note: RH = Ranch Hand.

Comparison: Current Dioxin \leq 10 ppt.

Background (Ranch Hand): Current Dioxin \leq 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin \leq 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table I-3-16.
Analysis of Cholesterol (mg/dl)
(Continuous)
Occupation Removed from Final Model

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY – ADJUSTED					
Dioxin Category	n	Adj. Mean^{ab}	Difference of Adj. Mean vs. Comparisons (95% C.I.)^c	p-Value^d	Covariate Remarks
Comparison	1,025	215.50			RACE (p=0.395) AGE*DRKYR (p=0.023) ALC*DC (p=0.061)
Background RH	362	215.28	-0.22 --	0.926	
Low RH	251	215.35	-0.15 --	0.955	
High RH	251	219.15	3.65 --	0.183	
Low plus High RH	502	217.24	1.74 --	0.405	

^a Transformed from natural logarithm scale.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^c Difference of adjusted means after transformation to original scale; confidence interval on difference of adjusted means not presented because analysis was performed on natural logarithm scale.

^d P-value is based on difference of means on natural logarithm scale.

Note: RH = Ranch Hand.

Comparison: Current Dioxin \leq 10 ppt.

Background (Ranch Hand): Current Dioxin \leq 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin \leq 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table I-3-17.
Analysis of Cholesterol
(Discrete)
Occupation Removed from Final Model

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED				
Dioxin Category	n	Adj. Relative Risk (95% C.I.) ^{ab}		p-Value
Comparison	1,027			
Background RH	367	1.09 (0.76,1.56)**	0.630**	
Low RH	254	1.24 (0.83,1.84)**	0.287**	
High RH	254	1.42 (0.97,2.10)**	0.073**	
Low plus High RH	508	1.33 (0.98,1.81)**	0.067**	

^a Relative risk and confidence interval relative to Comparisons.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

** Categorized dioxin-by-covariate interaction ($0.01 < p \leq 0.05$); adjusted relative risk, confidence interval, and p-value derived from a model fitted after deletion of this interaction; refer to Appendix Table I-4-9 for further analysis of this interaction.

Note: RH = Ranch Hand.

Comparison: Current Dioxin \leq 10 ppt.

Background (Ranch Hand): Current Dioxin \leq 10 ppt.

Low (Ranch Hand): Current Dioxin $>$ 10 ppt, 10 ppt $<$ Initial Dioxin \leq 143 ppt.

High (Ranch Hand): Current Dioxin $>$ 10 ppt, Initial Dioxin $>$ 143 ppt.

Table I-3-17. (Continued)
Analysis of Cholesterol
(Discrete)
Occupation Removed from Final Model

b) MODELS 4, 5, AND 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED				
Analysis Results for Log ₂ (Current Dioxin + 1)				
Model ^a	n	Adj. Relative Risk (95% C.I.) ^b	p-Value	Covariate Remarks
4	864	1.10 (0.96,1.26)	0.178	AGE (p=0.260) DRKYR (p=0.099) RACE*ALC (p=0.016)
5	864	1.21 (1.07,1.37)	0.002	DRKYR (p=0.060) RACE*ALC (p=0.014) DC*AGE (p=0.043)

^a Model 4: Log₂ (lipid-adjusted current dioxin + 1).

Model 5: Log₂ (whole-weight current dioxin + 1).

^b Relative risk for a twofold increase in current dioxin.

Table I-3-18.
Analysis of HDL Cholesterol (mg/dl)
(Continuous)
Occupation Removed from Final Model

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED						
Initial Dioxin Category Summary Statistics			Analysis Results for Log ₂ (Initial Dioxin) ^b			
Initial Dioxin	n	Adj. Mean ^{ab}	R ²	Adj. Slope (Std. Error) ^c	p-Value	Covariate Remarks
Low	170	41.84	0.186	-0.0146 (0.0079)	0.066	RACE*IC (p=0.033) ALC*DC (p=0.017)
Medium	163	39.74				
High	166	40.17				

^a Transformed from natural logarithm scale.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^c Slope and standard error based on natural logarithm of HDL cholesterol versus log₂ (initial dioxin).

Note: Low = 39-98 ppt; Medium = >98-232 ppt; High = >232 ppt.

Table I-3-18. (Continued)
Analysis of HDL Cholesterol (mg/dl)
(Continuous)
Occupation Removed from Final Model

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED					
Dioxin Category	n	Adj. Mean^{ab}	Difference of Adj. Mean vs. Comparisons (95% C.I.)^c	p-Value^d	Covariate Remarks
Comparison	1,016	42.46**			DXCAT*ALC (p<0.001) DXCAT*DRKYR (p=0.007)
Background RH	358	43.40**	0.93 --**	0.142**	RACE (p<0.001) ALC*IC (p=0.063)
Low RH	247	42.51**	0.05 --**	0.950**	
High RH	246	40.89**	-1.57 --**	0.027**	
Low plus High RH	493	41.69**	-0.77 --**	0.162**	

^a Transformed from natural logarithm scale.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^c Difference of adjusted means after transformation to original scale; confidence interval on difference of adjusted means not presented because analysis was performed on natural logarithm scale.

^d P-value is based on difference of means on natural logarithm scale.

** Categorized dioxin-by-covariate interactions ($p \leq 0.05$); adjusted mean, difference of adjusted means, confidence interval, and p-value derived from a model fitted after deletion of these interactions; refer to Appendix Table I-4-10 for further analysis of these interactions.

Note: RH = Ranch Hand.

Comparison: Current Dioxin \leq 10 ppt.

Background (Ranch Hand): Current Dioxin \leq 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin \leq 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table I-3-18. (Continued)
Analysis of HDL Cholesterol (mg/dl)
(Continuous)
Occupation Removed from Final Model

c) MODELS 4, 5, AND 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED							
Model ^b	Current Dioxin Category Adjusted Mean ^a /(n)			Analysis Results for Log ₂ (Current Dioxin + 1)			
	Low	Medium	High	R ²	Adj. Slope (Std. Error) ^c	p-Value	Covariate Remarks
4	44.43** (285)	42.55** (285)	40.27** (281)	0.121	-0.0258 (0.0061)**	<0.001**	CURR*DRKYR (p=0.011) RACE (p=0.042) ALC (p<0.001) AGE*DC (p=0.028)
5	44.85** (290)	42.26** (287)	40.01** (274)	0.130	-0.0252 (0.0052)**	<0.001**	CURR*DRKYR (p=0.002) RACE (p=0.050) ALC (p<0.001) AGE*DC (p=0.030)
6 ^d	43.94** (289)	41.97** (287)	40.54** (274)	0.156	-0.0168 (0.0056)**	0.003**	CURR*DRKYR (p=0.002) CURR*DC (p=0.018) RACE (p=0.094) ALC (p<0.001) AGE*DC (p=0.015)

^a Transformed from natural logarithm scale.

^b Model 4: Log₂ (lipid-adjusted current dioxin + 1).

Model 5: Log₂ (whole-weight current dioxin + 1).

Model 6: Log₂ (whole-weight current dioxin + 1), adjusted for log₂ total lipids.

^c Slope and standard error based on natural logarithm of HDL cholesterol versus log₂ (current dioxin + 1).

^d Adjusted for log₂ total lipids in addition to covariates specified under "Covariate Remarks" column.

** Log₂ (current dioxin + 1)-by-covariate interactions (p≤0.05); adjusted mean, adjusted slope, standard error, and p-value derived from a model fitted after deletion of these interactions; refer to Appendix Table I-4-10 for further analysis of these interactions.

Note: Model 4: Low = ≤ 8.1 ppt; Medium = >8.1-20.5 ppt; High = >20.5 ppt.

Models 5 and 6: Low = ≤ 46 ppq; Medium = >46-128 ppq; High = >128 ppq.

Table I-3-19.
Analysis of Cholesterol-HDL Ratio
(Continuous)
Occupation Removed from Final Model

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED						
Initial Dioxin Category Summary Statistics			Analysis Results for Log ₂ (Initial Dioxin) ^b			
Initial Dioxin	n	Adj. Mean ^{ab}	R ²	Adj. Slope (Std. Error) ^c	p-Value	Covariate Remarks
Low	169	5.09**	0.143	0.0243 (0.0097)**	0.012**	INIT*ALC (p=0.008) AGE (p=0.193)
Medium	161	5.28**				RACE*IC (p=0.016) DRKYR*IC (p=0.047)
High	163	5.36**				ALC*DC (p=0.042)

^a Transformed from natural logarithm scale.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^c Slope and standard error based on natural logarithm of cholesterol-HDL ratio versus log₂ (initial dioxin).

** Log₂ (initial dioxin)-by-covariate interaction ($p \leq 0.05$); adjusted mean, adjusted slope, standard error, and p-value derived from a model fitted after deletion of this interaction; refer to Appendix Table I-4-11 for further analysis of this interaction.

Note: Low = 39-98 ppt; Medium = >98-232 ppt; High = >232 ppt.

Table I-3-19. (Continued)
Analysis of Cholesterol-HDL Ratio
(Continuous)
Occupation Removed from Final Model

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED					
Dioxin Category	n	Adj. Mean ^{ab}	Difference of Adj. Mean vs. Comparisons (95% C.I.) ^c	p-Value ^d	Covariate Remarks
Comparison	1,018	5.09**			DXCAT*ALC (p=0.015) RACE (p=0.010)
Background RH	363	4.97**	-0.12 --**	0.163**	
Low RH	250	5.09**	0.00 --**	0.992**	
High RH	249	5.37**	0.28 --**	0.006**	
Low plus High RH	499	5.23**	0.14 --**	0.078**	

^a Transformed from natural logarithm scale.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^c Difference of adjusted means after transformation to original scale; confidence interval on difference of adjusted means not presented because analysis was performed on natural logarithm scale.

^d P-value is based on difference of means on natural logarithm scale.

** Categorized dioxin-by-covariate interaction ($p \leq 0.05$); adjusted mean, difference of adjusted means, confidence interval, and p-value derived from a model fitted after deletion of this interaction; refer to Appendix Table I-4-11 for further analysis of this interaction.

Note: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, $10 \text{ ppt} < \text{Initial Dioxin} \leq 143$ ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table I-3-20.
Analysis of Cholesterol-HDL Ratio
(Discrete)
Occupation Removed from Final Model

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED			
Analysis Results for Log₂ (Initial Dioxin)^a			
n	Adj. Relative Risk (95% C.I.)^b	p-Value	Covariate Remarks
499	1.13 (0.97,1.32)	0.116	AGE (p=0.263) ALC (p<0.001) RACE*IC (p=0.006) RACE*DC (p=0.026)

^a Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^b Relative risk for a twofold increase in initial dioxin.

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED				
Dioxin Category	n	Adj. Relative Risk (95% C.I.)^{ab}	p-Value	Covariate Remarks
Comparison	1,018			RACE (p=0.054) DC (p=0.001) ALC (p<0.001)
Background RH	363	0.94 (0.73,1.21)	0.632	
Low RH	250	1.03 (0.78,1.38)	0.816	
High RH	249	1.40 (1.03,1.89)	0.030	
Low plus High RH	499	1.19 (0.95,1.50)	0.122	

^a Relative risk and confidence interval relative to Comparisons.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

Note: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table I-3-21.
Analysis of Triglycerides (mg/dl)
(Continuous)
Occupation Removed from Final Model

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED						
Initial Dioxin Category Summary Statistics			Analysis Results for Log ₂ (Initial Dioxin) ^b			
Initial Dioxin	n	Adj. Mean ^{ab}	R ²	Adj. Slope (Std. Error) ^c	p-Value	Covariate Remarks
Low	173	129.02	0.051	0.0329 (0.0189)	0.083	RACE (p=0.003)
Medium	170	143.36				
High	172	140.37				

^a Transformed from natural logarithm scale.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^c Slope and standard error based on natural logarithm of triglycerides versus log₂ (initial dioxin).

Note: Low = 39-98 ppt; Medium = >98-232 ppt; High = >232 ppt.

Table I-3-21. (Continued)
Analysis of Triglycerides (mg/dl)
(Continuous)
Occupation Removed from Final Model

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED					
Dioxin Category	n	Adj. Mean^{ab}	Difference of Adj. Mean vs. Comparisons (95% C.I.)^c	p-Value^d	Covariate Remarks
Comparison	1,025	131.01			RACE (p<0.001) AGE*DRKYR (p=0.014)
Background RH	362	125.14	-5.87 --	0.173	
Low RH	251	132.51	1.50 --	0.767	
High RH	251	146.33	15.32 --	0.004	
Low plus High RH	502	139.25	8.24 --	0.040	

^a Transformed from natural logarithm scale.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^c Difference of adjusted means after transformation to original scale; confidence interval on difference of adjusted means not presented because analysis was performed on natural logarithm scale.

^d P-value is based on difference of means on natural logarithm scale.

Note: RH = Ranch Hand.

Comparison: Current Dioxin \leq 10 ppt.

Background (Ranch Hand): Current Dioxin \leq 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin \leq 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table I-3-21. (Continued)
Analysis of Triglycerides (mg/dl)
(Continuous)
Occupation Removed from Final Model

c) MODELS 4, 5, AND 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED							
Model ^b	Current Dioxin Category Adjusted Mean ^a /(n)			Analysis Results for Log ₂ (Current Dioxin + 1)			
	Low	Medium	High	R ²	Adj. Slope (Std. Error) ^c	p-Value	Covariate Remarks
4	116.76 (290)	128.23 (298)	147.60 (296)	0.039	0.0648 (0.0129)	<0.001	RACE (p=0.001)
5	108.82** (290)	128.94** (290)	159.69** (284)	0.095	0.0944 (0.0112)**	<0.001**	CURR*DRKYR (p=0.033) RACE (p=0.002) AGE*DRKYR (p=0.039)
6 ^d	130.73** (289)	137.21** (290)	142.23** (284)	0.394	0.0212 (0.0097)**	0.029**	CURR*DRKYR (p=0.040) RACE (p=0.017) ALC (p=0.156)

^a Transformed from natural logarithm scale.

^b Model 4: Log₂ (lipid-adjusted current dioxin + 1).

Model 5: Log₂ (whole-weight current dioxin + 1).

Model 6: Log₂ (whole-weight current dioxin + 1), adjusted for log₂ total lipids.

^c Slope and standard error based on natural logarithm of triglycerides versus log₂ (current dioxin + 1).

^d Adjusted for log₂ total lipids in addition to covariates specified under "Covariate Remarks" column.

** Log₂ (current dioxin + 1)-by-covariate interaction (p ≤ 0.05); adjusted mean, adjusted slope, standard error, and p-value derived from a model fitted after deletion of this interaction; refer to Appendix Table I-4-12 for further analysis of this interaction.

Note: Model 4: Low = ≤ 8.1 ppt; Medium = >8.1-20.5 ppt; High = >20.5 ppt.

Models 5 and 6: Low = ≤ 46 ppq; Medium = >46-128 ppq; High = >128 ppq.

Table I-3-22.
Analysis of Triglycerides
(Discrete)
Occupation Removed from Final Model

a) MODELS 4, 5, AND 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED				
Model ^a	Analysis Results for Log ₂ (Current Dioxin + 1)			
	n	Adj. Relative Risk (95% C.I.) ^b	p-Value	Covariate Remarks
4	884	1.19 (1.04,1.37)	0.014	RACE (p=0.015)
5	884	1.34 (1.19,1.52)	<0.001	RACE (p=0.018)
6 ^c	883	1.04 (0.89,1.22)	0.627	DC (p=0.074)

^a Model 4: Log₂ (lipid-adjusted current dioxin + 1).
 Model 5: Log₂ (whole-weight current dioxin + 1).
 Model 6: Log₂ (whole-weight current dioxin + 1), adjusted for log₂ total lipids.

^b Relative risk for a twofold increase in current dioxin.

^c Adjusted for log₂ total lipids in addition to covariates specified under "Covariate Remarks" column.

Table I-3-23.
Analysis of Creatine Kinase (U/L)
(Continuous)
Occupation Removed from Final Model

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED					
Dioxin Category	n	Adj. Mean^{ab}	Difference of Adj. Mean vs. Comparisons (95% C.I.)^c	p-Value^d	Covariate Remarks
Comparison	1,025	170.63**			DXCAT*RACE (p=0.013) DXCAT*DRKYR (p=0.026) AGE (p=0.002) RACE*DRKYR (p=0.019)
Background RH	362	171.22**	0.58 --**	0.914**	
Low RH	251	166.94**	-3.69 --**	0.547**	
High RH	251	171.18**	0.55 --**	0.930**	
Low plus High RH	502	169.05**	-1.58 --**	0.740**	

^a Transformed from natural logarithm scale.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^c Difference of adjusted means after transformation to original scale; confidence interval on difference of adjusted means not presented because analysis was performed on natural logarithm scale.

^d P-value is based on difference of means on natural logarithm scale.

** Categorized dioxin-by-covariate interactions ($p \leq 0.05$); adjusted mean, difference of adjusted means, confidence interval, and p-value derived from a model fitted after deletion of these interactions; refer to Appendix Table I-4-13 for further analysis of these interactions.

Note: RH = Ranch Hand.

Comparison: Current Dioxin \leq 10 ppt.

Background (Ranch Hand): Current Dioxin \leq 10 ppt.

Low (Ranch Hand): Current Dioxin $>$ 10 ppt, 10 ppt $<$ Initial Dioxin \leq 143 ppt.

High (Ranch Hand): Current Dioxin $>$ 10 ppt, Initial Dioxin $>$ 143 ppt.

Table I-3-23. (Continued)
Analysis of Creatine Kinase (U/L)
(Continuous)
Occupation Removed from Final Model

b) MODELS 4, 5, AND 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED							
Model ^b	Current Dioxin Category Adjusted Mean ^a /(n)			Analysis Results for Log ₂ (Current Dioxin + 1)			
	Low	Medium	High	R ²	Adj. Slope (Std. Error) ^c	p-Value	Covariate Remarks
4	147.72 (287)	157.52 (290)	163.04 (287)	0.074	0.0306 (0.0119)	0.010	AGE (p=0.110) DC (p=0.019) RACE*DRKYR (p<0.001)
5	147.63 (290)	158.74 (290)	161.44 (284)	0.076	0.0281 (0.0101)	0.006	AGE (p=0.099) DC (p=0.017) RACE*DRKYR (p<0.001)
6 ^d	148.72 (289)	158.89 (290)	160.85 (284)	0.074	0.0250 (0.0110)	0.023	AGE (p=0.095) DC (p=0.021) RACE*DRKYR (p<0.001)

^a Transformed from natural logarithm scale.

^b Model 4: Log₂ (lipid-adjusted current dioxin + 1).

Model 5: Log₂ (whole-weight current dioxin + 1).

Model 6: Log₂ (whole-weight current dioxin + 1), adjusted for log₂ total lipids.

^c Slope and standard error based on natural logarithm of creatine kinase versus log₂ (current dioxin + 1).

^d Adjusted for log₂ total lipids in addition to covariates specified under "Covariate Remarks" column.

Note: Model 4: Low = ≤ 8.1 ppt; Medium = >8.1-20.5 ppt; High = >20.5 ppt.

Models 5 and 6: Low = ≤ 46 ppq; Medium = >46-128 ppq; High = >128 ppq.

Table I-3-24.
Analysis of Creatine Kinase
(Discrete)
Occupation Removed from Final Model

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED			
Analysis Results for Log₂ (Initial Dioxin)^a			
n	Adj. Relative Risk (95% C.I.)^b	p-Value	Covariate Remarks
502	1.05 (0.85,1.30)	0.649	ALC (p=0.255) AGE*DRKYR (p=0.002) RACE*DRKYR (p<0.001)

^a Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^b Relative risk for a twofold increase in initial dioxin.

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED				
Dioxin Category	n	Adj. Relative Risk (95% C.I.)^{ab}	p-Value	Covariate Remarks
Comparison	1,025			DXCAT*RACE (p=0.005) DXCAT*DRKYR (p=0.031) RACE*ALC (p<0.001) IC*ALC (p=0.067) DC*ALC (p<0.001)
Background RH	362	1.11 (0.76,1.64)**	0.583**	
Low RH	251	0.83 (0.53,1.29)**	0.404**	
High RH	251	1.12 (0.74,1.69)**	0.584**	
Low plus High RH	502	0.97 (0.70,1.35)**	0.858**	

^a Relative risk and confidence interval relative to Comparisons.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

** Categorized dioxin-by-covariate interactions ($0.01 < p \leq 0.05$); adjusted relative risk, confidence interval, and p-value derived from a model fitted after deletion of these interactions; refer to Appendix Table I-4-14 for further analysis of these interactions.

Note: RH = Ranch Hand.

Comparison: Current Dioxin \leq 10 ppt.

Background (Ranch Hand): Current Dioxin \leq 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin \leq 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table I-3-24. (Continued)
Analysis of Creatine Kinase
(Discrete)
Occupation Removed from Final Model

c) MODELS 4, 5, AND 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED				
Model ^a	Analysis Results for Log ₂ (Current Dioxin + 1)			
	n	Adj. Relative Risk (95% C.I.) ^b	p-Value	Covariate Remarks
4	864	1.08 (0.94,1.24)	0.283	ALC (p=0.849) RACE*DRKYR (p=0.003) AGE*DRKYR (p=0.004)
5	864	1.06 (0.94,1.20)	0.325	ALC (p=0.863) RACE*DRKYR (p=0.003) AGE*DRKYR (p=0.004)
6 ^c	863	1.07 (0.94,1.22)	0.324	ALC (p=0.851) RACE*DRKYR (p=0.003) AGE*DRKYR (p=0.004)

^a Model 4: Log₂ (lipid-adjusted current dioxin + 1).

Model 5: Log₂ (whole-weight current dioxin + 1).

Model 6: Log₂ (whole-weight current dioxin + 1), adjusted for log₂ total lipids.

^b Relative risk for a twofold increase in current dioxin.

^c Adjusted for log₂ total lipids in addition to covariates specified under "Covariate Remarks" column.

Table I-3-25.
Analysis of Serum Amylase (U/L)
(Continuous)
Occupation Removed from Final Model

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED					
Dioxin Category	n	Adj. Mean^{ab}	Difference of Adj. Mean vs. Comparisons (95% C.I.)^c	p-Value^d	Covariate Remarks
Comparison	1,027	82.73			RACE (p<0.001) ALC (p=0.005) IC (p=0.113) AGE*DC (p=0.113)
Background RH	367	80.54	-2.18 --	0.211	
Low RH	254	85.26	2.53 --	0.216	
High RH	254	81.01	-1.71 --	0.395	
Low plus High RH	508	83.11	0.38 --	0.807	

^a Transformed from natural logarithm scale.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^c Difference of adjusted means after transformation to original scale; confidence interval on difference of adjusted means not presented because analysis was performed on natural logarithm scale.

^d P-value is based on difference of means on natural logarithm scale.

Note: RH = Ranch Hand.

Comparison: Current Dioxin \leq 10 ppt.

Background (Ranch Hand): Current Dioxin \leq 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin \leq 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table I-3-25. (Continued)
Analysis of Serum Amylase (U/L)
(Continuous)
Occupation Removed from Final Model

b) MODELS 4, 5, AND 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED							
Model ^b	Current Dioxin Category Adjusted Mean ^a /(n)			Analysis Results for Log ₂ (Current Dioxin + 1)			
	Low	Medium	High	R ²	Adj. Slope (Std. Error) ^c	p-Value	Covariate Remarks
4	83.84 (290)	83.44 (298)	80.91 (296)	0.038	-0.0137 (0.0082)	0.096	AGE (p=0.067) RACE (p<0.001)
5	83.43 (294)	84.07 (297)	80.27 (293)	0.039	-0.0136 (0.0070)	0.053	AGE (p=0.066) RACE (p<0.001)
6 ^d	82.15 (293)	83.69 (297)	81.03 (293)	0.043	-0.0075 (0.0076)	0.321	AGE (p=0.041) RACE (p<0.001)

^a Transformed from natural logarithm scale.

^b Model 4: Log₂ (lipid-adjusted current dioxin + 1).

Model 5: Log₂ (whole-weight current dioxin + 1).

Model 6: Log₂ (whole-weight current dioxin + 1), adjusted for log₂ total lipids.

^c Slope and standard error based on natural logarithm of serum amylase versus log₂ (current dioxin + 1).

^d Adjusted for log₂ total lipids in addition to covariates specified under "Covariate Remarks" column.

Note: Model 4: Low = ≤ 8.1 ppt; Medium = >8.1-20.5 ppt; High = >20.5 ppt.

Models 5 and 6: Low = ≤ 46 ppq; Medium = >46-128 ppq; High = >128 ppq.

Table I-3-26.
Analysis of Serum Amylase
(Discrete)
Occupation Removed from Final Model

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED			
Analysis Results for Log₂ (Initial Dioxin)^a			
n	Adj. Relative Risk (95% C.I.)^b	p-Value	Covariate Remarks
508	0.92 (0.65,1.31)	0.636	AGE (p<0.001) RACE (p<0.001) DC (p=0.026) ALC (p=0.172)

^a Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^b Relative risk for a twofold increase in initial dioxin.

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED				
Dioxin Category	n	Adj. Relative Risk (95% C.I.)^{ab}	p-Value	Covariate Remarks
Comparison	1,043			DXCAT*RACE (p=0.015) AGE (p=0.003) DC (p=0.376)
Background RH	369	0.77 (0.48,1.24)**	0.285**	
Low RH	257	0.79 (0.46,1.36)**	0.389**	
High RH	258	0.66 (0.35,1.25)**	0.202**	
Low plus High RH	515	0.73 (0.47,1.14)**	0.166**	

^a Relative risk and confidence interval relative to Comparisons.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

** Categorized dioxin-by-covariate interaction (p≤0.05); adjusted relative risk, confidence interval, and p-value derived from a model fitted after deletion of this interaction; refer to Appendix Table I-4-15 for further analysis of this interaction.

Note: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table I-3-26. (Continued)
Analysis of Serum Amylase
(Discrete)
Occupation Removed from Final Model

c) MODELS 4, 5, AND 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED				
Model ^a	Analysis Results for Log ₂ (Current Dioxin + 1)			
	n	Adj. Relative Risk (95% C.I.) ^b	p-Value	Covariate Remarks
4	884	0.89 (0.72,1.11)	0.288	AGE (p=0.003) RACE (p<0.001) DC (p=0.024)
5	884	0.90 (0.75,1.08)	0.259	AGE (p=0.003) RACE (p<0.001) DC (p=0.024)
6 ^c	883	0.93 (0.77,1.13)	0.495	AGE (p=0.002) RACE (p<0.001) DC (p=0.022)

^a Model 4: Log₂ (lipid-adjusted current dioxin + 1).
Model 5: Log₂ (whole-weight current dioxin + 1).
Model 6: Log₂ (whole-weight current dioxin + 1), adjusted for log₂ total lipids.

^b Relative risk for a twofold increase in current dioxin.

^c Adjusted for log₂ total lipids in addition to covariates specified under "Covariate Remarks" column.

Table I-3-27.
Analysis of Antibodies for Hepatitis A
Occupation Removed from Final Model

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED			
Analysis Results for Log₂ (Initial Dioxin)^a			
n	Adj. Relative Risk (95% C.I.)^b	p-Value	Covariate Remarks
507	1.14 (0.97,1.33)	0.107	AGE (p<0.001) RACE*DC (p=0.004) RACE*DRKYR (p<0.001) IC*DRKYR (p=0.004)

^a Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^b Relative risk for a twofold increase in initial dioxin.

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED				
Dioxin Category	n	Adj. Relative Risk (95% C.I.)^{ab}	p-Value	Covariate Remarks
Comparison	1,063			RACE*AGE (p=0.071)
Background RH	374	0.79 (0.61,1.03)	0.083	
Low RH	260	0.91 (0.68,1.21)	0.543	
High RH	260	1.35 (1.00,1.82)	0.052	
Low plus High RH	520	1.10 (0.87,1.39)	0.418	

^a Relative risk and confidence interval relative to Comparisons.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

Note: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table I-3-27. (Continued)
Analysis of Antibodies for Hepatitis A
Occupation Removed from Final Model

c) MODELS 4, 5, AND 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED				
Model ^a	Analysis Results for Log ₂ (Current Dioxin + 1)			
	n	Adj. Relative Risk (95% C.I.) ^b	p-Value	Covariate Remarks
4	874	1.18 (1.06,1.32)	0.002	RACE*AGE (p=0.027) RACE*DRKYR (p=0.033)
5	874	1.15 (1.05,1.26)	0.002	RACE*AGE (p=0.030) RACE*DRKYR (p=0.036)
6 ^c	873	1.16 (1.05,1.28)	0.004	RACE*AGE (p=0.031) RACE*DRKYR (p=0.040)

^a Model 4: Log₂ (lipid-adjusted current dioxin + 1).
Model 5: Log₂ (whole-weight current dioxin + 1).
Model 6: Log₂ (whole-weight current dioxin + 1), adjusted for log₂ total lipids.

^b Relative risk for a twofold increase in current dioxin.

^c Adjusted for log₂ total lipids in addition to covariates specified under "Covariate Remarks" column.

Table I-3-28.
Analysis of Serological Evidence of Prior Hepatitis B Infection
Occupation Removed from Final Model

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED			
Analysis Results for Log _e (Initial Dioxin) ^a			
n	Adj. Relative Risk (95% C.I.) ^b	p-Value	Covariate Remarks
507	1.31 (1.05,1.63)	0.016	AGE (p=0.093) RACE*DRKYR (p<0.001)

^a Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^b Relative risk for a twofold increase in initial dioxin.

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED				
Dioxin Category	n	Adj. Relative Risk (95% C.I.) ^{ab}	p-Value	Covariate Remarks
Comparison	1,045			DXCAT*AGE (p=0.044) RACE (p<0.001) DRKYR (p=0.014)
Background RH	367	0.63 (0.42,0.93)**	0.020**	
Low RH	254	0.58 (0.37,0.91)**	0.018**	
High RH	253	0.82 (0.54,1.24)**	0.344**	
Low plus High RH	507	0.69 (0.50,0.96)**	0.028**	

^a Relative risk and confidence interval relative to Comparisons.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

** Categorized dioxin-by-covariate interaction ($p \leq 0.05$); adjusted relative risk, confidence interval, and p-value derived from a model fitted after deletion of this interaction; refer to Appendix Table I-4-17 for further analysis of this interaction.

Note: RH = Ranch Hand.

Comparison: Current Dioxin \leq 10 ppt.

Background (Ranch Hand): Current Dioxin \leq 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin \leq 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table I-3-28. (Continued)
Analysis of Serological Evidence of Prior Hepatitis B Infection
Occupation Removed from Final Model

c) MODELS 4, 5, AND 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED				
Model ^a	Analysis Results for Log ₂ (Current Dioxin + 1)			
	n	Adj. Relative Risk (95% C.I.) ^b	p-Value	Covariate Remarks
4	874	1.11 (0.96,1.29)	0.156	RACE*DRKYR (p=0.001)
5	874	1.09 (0.96,1.24)	0.180	RACE*DRKYR (p=0.001)
6 ^c	873	1.09 (0.95,1.25)	0.226	RACE*DRKYR (p=0.001)

^a Model 4: Log₂ (lipid-adjusted current dioxin + 1).

Model 5: Log₂ (whole-weight current dioxin + 1).

Model 6: Log₂ (whole-weight current dioxin + 1), adjusted for log₂ total lipids.

^b Relative risk for a twofold increase in current dioxin.

^c Adjusted for log₂ total lipids in addition to covariates specified under "Covariate Remarks" column.

Table I-3-29.
Analysis of Stool Hemocult
Occupation Removed from Final Model

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED				
Dioxin Category	n	Adj. Relative Risk (95% C.I.) ^{ab}	p-Value	Covariate Remarks
Comparison	987			RACE*DRKYR (p=0.015) IC*ALC (p<0.001) DC*DRKYR (p=0.074)
Background RH	351	0.93 (0.35,2.43)	0.876	
Low RH	241	2.33 (1.01,5.40)	0.049	
High RH	236	1.00 (0.32,3.13)	0.995	
Low plus High RH	477	1.68 (0.79,3.55)	0.177	

^a Relative risk and confidence interval relative to Comparisons.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

Note: RH = Ranch Hand.

Comparison: Current Dioxin \leq 10 ppt.

Background (Ranch Hand): Current Dioxin \leq 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin \leq 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table I-3-29. (Continued)
Analysis of Stool Hemocult
Occupation Removed from Final Model

b) MODELS 4, 5, AND 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED				
Model^a	Analysis Results for Log₂ (Current Dioxin + 1)			
	n	Adj. Relative Risk (95% C.I.)^b	p-Value	Covariate Remarks
4	828	1.04 (0.75,1.43)	0.835	DRKYR (p=0.049) RACE*ALC (p=0.014) IC*ALC (p=0.021)
5	828	1.07 (0.81,1.42)	0.625	DRKYR (p=0.050) RACE*ALC (p=0.015) IC*ALC (p=0.020)
6 ^c	827	1.00 (0.74,1.36)	0.978	DRKYR (p=0.049) RACE*ALC (p=0.021) IC*ALC (p=0.024)

^a Model 4: Log₂ (lipid-adjusted current dioxin + 1).

Model 5: Log₂ (whole-weight current dioxin + 1).

Model 6: Log₂ (whole-weight current dioxin + 1), adjusted for log₂ total lipids.

^b Relative risk for a twofold increase in current dioxin.

^c Adjusted for log₂ total lipids in addition to covariates specified under "Covariate Remarks" column.

Table I-3-30.
Analysis of Prealbumin (mg/dl)
(Continuous)
Occupation Removed from Final Model

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED					
Dioxin Category	n	Adj. Mean ^a	Difference of Adj. Mean vs. Comparisons (95% C.I.)	p-Value	Covariate Remarks
Comparison	1,025	27.72**			DXCAT*IC (p=0.013) ALC (p<0.001) AGE*DRKYR (p=0.008)
Background RH	362	27.67**	-0.05 (-0.59,0.48)**	0.843**	
Low RH	251	27.80**	0.08 (-0.53,0.68)**	0.799**	
High RH	251	27.72**	0.00 (-0.62,0.61)**	0.992**	
Low plus High RH	502	27.76**	0.04 (-0.43,0.51)**	0.875**	

^a Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

** Categorized dioxin-by-covariate interaction ($0.01 < p \leq 0.05$); adjusted mean, difference of adjusted means, confidence interval, and p-value derived from a model fitted after deletion of this interaction; refer to Appendix Table I-4-17 for further analysis of this interaction.

Note: RH = Ranch Hand.

Comparison: Current Dioxin \leq 10 ppt.

Background (Ranch Hand): Current Dioxin \leq 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin \leq 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table I-3-30. (Continued)
Analysis of Prealbumin (mg/dl)
(Continuous)
Occupation Removed from Final Model

b) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED							
Model ^a	Current Dioxin Category Adjusted Mean/(n)			Analysis Results for Log ₂ (Current Dioxin + 1)			
	Low	Medium	High	R ²	Adj. Slope (Std. Error)	p-Value	Covariate Remarks
5	27.80** (290)	27.83** (290)	27.78** (284)	0.051	0.1017 (0.0918)**	0.268**	CURR*DC (p=0.010) ALC (p<0.001) DRKYR (p=0.072) AGE*DC (p=0.024)

^a Log₂ (whole-weight current dioxin + 1).

** Log₂ (current dioxin+1)-by covariate interaction (p≤0.05); adjusted mean, adjusted slope, standard error, and p-value derived from a model fitted after deletion of this interaction; refer to Appendix Table I-4-17 for further analysis of this interaction.

Table I-3-31.
Analysis of Albumin (mg/dl)
(Continuous)
Occupation Removed from Final Model

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY – ADJUSTED					
Dioxin Category	n	Adj. Mean ^a	Difference of Adj. Mean vs. Comparisons (95% C.I.)	p-Value	Covariate Remarks
Comparison	1,027	3,910.54			RACE (p=0.003) ALC (p=0.129) AGE*IC (p=0.005)
Background RH	367	3,893.03	-17.50 (-53.42,18.41)	0.340	
Low RH	254	3,894.74	-15.80 (-56.78,25.19)	0.450	
High RH	254	3,930.05	19.52 (-21.78,60.82)	0.354	
Low plus High RH	508	3,912.40	1.86 (-29.89,33.60)	0.909	

^a Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

Note: RH = Ranch Hand.

Comparison: Current Dioxin \leq 10 ppt.

Background (Ranch Hand): Current Dioxin \leq 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin \leq 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table I-3-31. (Continued)
Analysis of Albumin (mg/dl)
(Continuous)
Occupation Removed from Final Model

b) MODELS 4, 5, AND 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED							
Model ^a	Current Dioxin Category Adjusted Mean/(n)			Analysis Results for Log ₂ (Current Dioxin + 1)			
	Low	Medium	High	R ²	Adj. Slope (Std. Error)	p-Value	Covariate Remarks
4	3,930.18** (289)	3,881.96** (295)	3,924.83** (291)	0.033	-1.8788 (7.2988)**	0.797**	CURR*DC (p=0.011) RACE (p=0.048) ALC (p=0.928) AGE*IC (p=0.030)
5	3,925.49** (292)	3,889.38** (295)	3,922.70** (288)	0.033	1.0628 (6.2292)**	0.865**	CURR*DC (p=0.010) RACE (p=0.051) ALC (p=0.956) AGE*IC (p=0.031)
6 ^b	3,937.09** (291)	3,893.20** (295)	3,915.43** (288)	0.037	-3.6291 (6.7292)**	0.590**	CURR*DC (p=0.010) RACE (p=0.068) ALC (p=0.929) AGE*IC (p=0.036)

^a Model 4: Log₂ (lipid-adjusted current dioxin + 1).

Model 5: Log₂ (whole-weight current dioxin + 1).

Model 6: Log₂ (whole-weight current dioxin + 1), adjusted for log₂ total lipids.

^b Adjusted for log₂ total lipids in addition to covariates specified under "Covariate Remarks" column.

** Log₂ (current dioxin + 1)-by covariate interaction (p ≤ 0.05); adjusted mean, adjusted slope, standard error, and p-value derived from a model fitted after deletion of this interaction; refer to Appendix Table I-4-18 for further analysis of this interaction.

Note: Model 4: Low = ≤ 8.1 ppt; Medium = >8.1-20.5 ppt; High = >20.5 ppt.

Models 5 and 6: Low = ≤ 46 ppq; Medium = >46-128 ppq; High = >128 ppq.

Table I-3-32.
Analysis of α -1 Acid Glycoprotein (mg/dl)
(Continuous)
Occupation Removed from Final Model

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED						
Initial Dioxin Category Summary Statistics			Analysis Results for Log ₂ (Initial Dioxin) ^b			
Initial Dioxin	n	Adj. Mean ^{ab}	R ²	Adj. Slope (Std. Error) ^c	p-Value	Covariate Remarks
Low	170	54.36**	0.046	0.0009 (0.0071)**	0.898**	INIT*DRKYR (p=0.002) RACE (p=0.018) IC (p=0.753)
Medium	165	56.02**				
High	167	55.39**				

^a Transformed from natural logarithm scale.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^c Slope and standard error based on natural logarithm of α -1 acid glycoprotein versus log₂ (initial dioxin).

** Log₂ (initial dioxin)-by-covariate interaction (p ≤ 0.05); adjusted mean, adjusted slope, standard error, and p-value derived from a model fitted after deletion of this interaction; refer to Appendix Table I-4-19 for further analysis of this interaction.

Note: Low = 39-98 ppt; Medium = >98-232 ppt; High = >232 ppt.

Table I-3-32. (Continued)
Analysis of α -1 Acid Glycoprotein (mg/dl)
(Continuous)
Occupation Removed from Final Model

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED					
Dioxin Category	n	Adj. Mean^{ab}	Difference of Adj. Mean vs. Comparisons (95% C.I.)^c	p-Value^d	Covariate Remarks
Comparison	1,025	54.54**			DXCAT*DRKYR (p=0.014)
Background RH	362	53.46**	-1.09 ---	0.137**	RACE (p=0.027)
Low RH	251	55.34**	0.80 ---	0.347**	AGE*ALC (p=0.057)
High RH	251	55.65**	1.10 ---	0.199**	ALC*DRKYR (p=0.024)
Low plus High RH	502	55.49**	0.95 ---	0.148**	IC*DC (p=0.023)

^a Transformed from natural logarithm scale.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^c Difference of adjusted means after transformation to original scale; confidence interval on difference of adjusted means not presented because analysis was performed on natural logarithm scale.

^d P-value is based on difference of means on natural logarithm scale.

** Categorized dioxin-by-covariate interaction ($0.01 < p \leq 0.05$); adjusted mean, difference of adjusted means, confidence interval, and p-value derived from a model fitted after deletion of this interaction; refer to Appendix Table I-4-19 for further analysis of this interaction.

Note: RH = Ranch Hand.

Comparison: Current Dioxin \leq 10 ppt.

Background (Ranch Hand): Current Dioxin \leq 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin \leq 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table I-3-32. (Continued)
Analysis of α -1 Acid Glycoprotein (mg/dl)
(Continuous)
Occupation Removed from Final Model

c) MODELS 4, 5, AND 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED							
Model ^b	Current Dioxin Category Adjusted Mean ^a /(n)			Analysis Results for Log ₂ (Current Dioxin + 1)			
	Low	Medium	High	R ²	Adj. Slope (Std. Error) ^c	p-Value	Covariate Remarks
4	53.68** (287)	54.62** (290)	55.57** (287)	0.031	0.0060 (0.0051)**	0.245**	CURR*DRKYR (p=0.012) AGE (p=0.085) RACE (p=0.030) ALC (p=0.081) IC (p=0.414)
5	53.73 (290)	54.18 (290)	56.24 (284)	0.026	0.0077 (0.0044)	0.078	AGE (p=0.085) RACE (p=0.029) ALC (p=0.116) DRKYR (p=0.034) IC (p=0.451)
6 ^d	54.39 (289)	54.42 (290)	55.77 (284)	0.039	0.0027 (0.0047)	0.572	AGE (p=0.038) RACE (p=0.049) ALC (p=0.177) DRKYR (p=0.037) IC (p=0.460)

^a Transformed from natural logarithm scale.

^b Model 4: Log₂ (lipid-adjusted current dioxin + 1).

Model 5: Log₂ (whole-weight current dioxin + 1).

Model 6: Log₂ (whole-weight current dioxin + 1), adjusted for log₂ total lipids.

^c Slope and standard error based on natural logarithm of α -1 acid glycoprotein versus log₂ (current dioxin + 1).

^d Adjusted for log₂ total lipids in addition to covariates specified under "Covariate Remarks" column.

** Log₂ (current dioxin + 1)-by-covariate interaction (0.01 < p ≤ 0.05); adjusted mean, adjusted slope, standard error, and p-value derived from a model fitted after deletion of this interaction; refer to Appendix Table I-4-19 for further analysis of this interaction.

Note: Model 4: Low = ≤ 8.1 ppt; Medium = >8.1-20.5 ppt; High = >20.5 ppt.

Models 5 and 6: Low = ≤ 46 ppq; Medium = >46-128 ppq; High = >128 ppq.

Table I-3-33.
Analysis of α -1 Acid Glycoprotein
(Discrete)
Occupation Removed from Final Model

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED			
Analysis Results for Log₂ (Initial Dioxin)^a			
n	Adj. Relative Risk (95% C.I.)^b	p-Value	Covariate Remarks
515	1.14 (0.70,1.85)	0.597	AGE (p=0.270) DC (p=0.136)

^a Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^b Relative risk for a twofold increase in initial dioxin.

b) MODELS 4, 5, AND 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED				
Analysis Results for Log₂ (Current Dioxin + 1)				
Model^a	n	Adj. Relative Risk (95% C.I.)^b	p-Value	Covariate Remarks
4	864	1.07 (0.79,1.47)	0.660	AGE (p=0.430) DRKYR (p=0.180)
5	864	1.05 (0.80,1.38)	0.715	AGE (p=0.411) DRKYR (p=0.178)
6 ^c	863	1.09 (0.81,1.46)	0.566	AGE (p=0.451) DRKYR (p=0.169)

^a Model 4: Log₂ (lipid-adjusted current dioxin + 1).

Model 5: Log₂ (whole-weight current dioxin + 1).

Model 6: Log₂ (whole-weight current dioxin + 1), adjusted for log₂ total lipids.

^b Relative risk for a twofold increase in current dioxin.

^c Adjusted for log₂ total lipids in addition to covariates specified under "Covariate Remarks" column.

Table I-3-34.
Analysis of α -1 Antitrypsin (mg/dl)
(Continuous)
Occupation Removed from Final Model

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED						
Initial Dioxin Category Summary Statistics			Analysis Results for Log ₂ (Initial Dioxin) ^a			
Initial Dioxin	n	Adj. Mean ^a	R ²	Adj. Slope (Std. Error)	p-Value	Covariate Remarks
Low	170	143.54**	0.089	1.1039 (0.9378)**	0.240**	INIT*DC (p=0.009) INIT*IC (p=0.023) AGE (p=0.025) RACE (p=0.034) DRKYR (p=0.006) IC*WINE (p=0.014)
Medium	165	148.28**				
High	167	147.31**				

^a Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

** Log₂ (initial dioxin)-by-covariate interaction ($p \leq 0.05$); adjusted mean, adjusted slope, standard error, and p-value derived from a model fitted after deletion of this interaction; refer to Appendix Table I-4-20 for further analysis of this interaction.

Note: Low = 39-98 ppt; Medium = >98-232 ppt; High = >232 ppt.

Table I-3-34. (Continued)
Analysis of α -1 Antitrypsin (mg/dl)
(Continuous)
Occupation Removed from Final Model

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED					
Dioxin Category	n	Adj. Mean^a	Difference of Adj. Mean vs. Comparisons (95% C.I.)	p-Value	Covariate Remarks
Comparison	1,025	146.48			AGE (p<0.001) RACE (p=0.092) DRKYR (p<0.001) WINE (p<0.001) DC (p<0.001)
Background RH	362	149.15	2.67 (-0.58,5.92)	0.108	
Low RH	251	147.54	1.07 (-2.63,4.76)	0.572	
High RH	251	148.75	2.27 (-1.47,6.01)	0.235	
Low plus High RH	502	148.15	1.67 (-1.20,4.53)	0.254	

^a Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

Note: RH = Ranch Hand.

Comparison: Current Dioxin \leq 10 ppt.

Background (Ranch Hand): Current Dioxin \leq 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin \leq 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table I-3-34. (Continued)
Analysis of α -1 Antitrypsin (mg/dl)
(Continuous)
Occupation Removed from Final Model

c) MODELS 4, 5, AND 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED							
Model ^a	Current Dioxin Category Adjusted Mean/(n)			Analysis Results for Log ₂ (Current Dioxin + 1)			
	Low	Medium	High	R ²	Adj. Slope (Std. Error)	p-Value	Covariate Remarks
4	149.41** (287)	145.58** (290)	146.40** (287)	0.060	-0.7535 (0.6573)**	0.252**	CURR*DC (p=0.022) AGE (p<0.001) RACE (p=0.048) DRKYR (p=0.001) IC*WINE (p=0.188)
5	149.98** (290)	144.34** (290)	147.78** (284)	0.063	-1.0583 (0.5609)**	0.060**	CURR*DC (p=0.020) AGE (p<0.001) RACE (p=0.043) DRKYR (p=0.001) IC*WINE (p=0.187)
6 ^b	149.00** (289)	144.16** (290)	148.34** (284)	0.061	-0.6061 (0.6043)**	0.316**	CURR*DC (p=0.038) AGE (p<0.001) RACE (p=0.039) DRKYR (p<0.001) IC*WINE (p=0.187)

^a Model 4: Log₂ (lipid-adjusted current dioxin + 1).
Model 5: Log₂ (whole-weight current dioxin + 1).
Model 6: Log₂ (whole-weight current dioxin + 1), adjusted for log₂ total lipids.

^b Adjusted for log₂ total lipids in addition to covariates specified under "Covariate Remarks" column.

** Log₂ (current dioxin + 1)-by covariate interaction (0.01 < p ≤ 0.05); adjusted mean, adjusted slope, standard error, and p-value derived from a model fitted after deletion of this interaction; refer to Appendix Table I-4-20 for further analysis of this interaction.

Note: Model 4: Low = ≤ 8.1 ppt; Medium = >8.1-20.5 ppt; High = >20.5 ppt.
Models 5 and 6: Low = ≤ 46 ppq; Medium = >46-128 ppq; High = >128 ppq.

Table I-3-35.
Analysis of α -1 Antitrypsin
(Discrete)
Occupation Removed from Final Model

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED						
Dioxin Category	n	Low vs. Normal		High vs. Normal		Covariate Remarks
		Adj. Relative Risk (95% C.I.)^{a,b}	p-Value	Adj. Relative Risk (95% C.I.)^{a,b}	p-Value	
Comparison	1,043					AGE (p=0.025) RACE (p=0.039)
Background RH	369	1.52 (0.71,3.24)	0.282	1.60 (0.65,3.94)	0.308	
Low RH	257	0.88 (0.29,2.60)	0.810	1.14 (0.39,3.32)	0.809	
High RH	258	0.80 (0.27,2.40)	0.695	0.27 (0.03,2.14)	0.214	
Low plus High RH	515	0.84 (0.37,1.92)	0.677	0.75 (0.28,2.05)	0.576	

^a Relative risk and confidence interval relative to Comparisons.

^b Adjusted for percent body fat at the time of duty in SEA, change in body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

Note: RH = Ranch Hand.

Comparison: Current Dioxin \leq 10 ppt.

Background (Ranch Hand): Current Dioxin \leq 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin \leq 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table I-3-36.
Analysis of α -2 Macroglobulin (mg/dl)
(Continuous)
Occupation Removed from Final Model

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED					
Dioxin Category	n	Adj. Mean^{ab}	Difference of Adj. Mean vs. Comparisons (95% C.I.)^c	p-Value^d	Covariate Remarks
Comparison	1,025	130.54			AGE (p<0.001) RACE (p=0.003) DRKYR (p=0.023) ALC (p<0.001)
Background RH	362	129.09	-1.46 --	0.386	
Low RH	251	127.63	-2.91 --	0.127	
High RH	251	130.79	0.25 --	0.897	
Low plus High RH	502	129.20	-1.34 --	0.367	

^a Transformed from natural logarithm scale.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^c Difference of adjusted means after transformation to original scale; confidence interval on difference of adjusted means not presented because analysis was performed on natural logarithm scale.

^d P-value is based on difference of means on natural logarithm scale.

Note: RH = Ranch Hand.

Comparison: Current Dioxin \leq 10 ppt.

Background (Ranch Hand): Current Dioxin \leq 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin \leq 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table I-3-36. (Continued)
Analysis of α -2 Macroglobulin (mg/dl)
(Continuous)
Occupation Removed from Final Model

b) MODELS 4, 5, AND 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED							
Model ^b	Current Dioxin Category Adjusted Mean ^a /(n)			Analysis Results for Log ₂ (Current Dioxin + 1)			
	Low	Medium	High	R ²	Adj. Slope (Std. Error) ^c	p-Value	Covariate Remarks
4	130.55 (287)	127.57 (290)	130.35 (287)	0.089	-0.0028 (0.0050)	0.574	AGE (p<0.001) RACE (p=0.041) DRKYR (p=0.005) ALC (p=0.007)
5	130.97 (290)	126.89 (290)	131.08 (284)	0.089	-0.0025 (0.0043)	0.564	AGE (p<0.001) RACE (p=0.041) DRKYR (p=0.005) ALC (p=0.007)
6 ^d	131.29 (289)	127.07 (290)	130.76 (284)	0.090	-0.0034 (0.0047)	0.472	AGE (p<0.001) RACE (p=0.051) DRKYR (p=0.005) ALC (p=0.005)

^a Transformed from natural logarithm scale.

^b Model 4: Log₂ (lipid-adjusted current dioxin + 1).

Model 5: Log₂ (whole-weight current dioxin + 1).

Model 6: Log₂ (whole-weight current dioxin + 1), adjusted for log₂ total lipids.

^c Slope and standard error based on natural logarithm of α -2 macroglobulin versus log₂ (current dioxin + 1).

^d Adjusted for log₂ total lipids in addition to covariates specified under "Covariate Remarks" column.

Note: Model 4: Low = ≤ 8.1 ppt; Medium = >8.1 -20.5 ppt; High = >20.5 ppt.

Models 5 and 6: Low = ≤ 46 ppq; Medium = >46 -128 ppq; High = >128 ppq.

Table I-3-37.
Analysis of α -2 Macroglobulin
(Discrete)
Occupation Removed from Final Model

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED				
Dioxin Category	n	Adj. Relative Risk (95% C.I.) ^{ab}	p-Value	Covariate Remarks
Comparison	1,027			AGE (p=0.012) DC (p=0.068) ALC (p=0.069)
Background RH	367	0.36 (0.04,3.13)	0.355	
Low RH	254	--	--	
High RH	254	1.63 (0.29,9.28)	0.584	
Low plus High RH	508	0.59 (0.11,3.16)	0.533	

^a Relative risk and confidence interval relative to Comparisons.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

--: Adjusted relative risk, confidence interval, and p-value not presented due to the sparse number of abnormalities.

Table I-3-38.
Analysis of Apolipoprotein B (mg/dl)
(Continuous)
Occupation Removed from Final Model

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED					
Dioxin Category	n	Adj. Mean^{ab}	Difference of Adj. Mean vs. Comparisons (95% C.I.)^c	p-Value^d	Covariate Remarks
Comparison	1,025	148.23			RACE (p=0.457) ALC (p=0.080) DC (p=0.006) AGE*DRKYR (p=0.050)
Background RH	362	145.55	-2.69 --	0.220	
Low RH	251	146.25	-1.98 --	0.428	
High RH	251	152.43	4.20 --	0.105	
Low plus High RH	502	149.31	1.07 --	0.583	

^a Transformed from natural logarithm scale.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^c Difference of adjusted means after transformation to original scale; confidence interval on difference of adjusted means not presented because analysis was performed on natural logarithm scale.

^d P-value is based on difference of means on natural logarithm scale.

Note: RH = Ranch Hand.

Comparison: Current Dioxin \leq 10 ppt.

Background (Ranch Hand): Current Dioxin \leq 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin \leq 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table I-3-39.
Analysis of Apolipoprotein B
(Discrete)
Occupation Removed from Final Model

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED			
Analysis Results for Log ₂ (Initial Dioxin) ^a			
n	Adj. Relative Risk (95% C.I.) ^b	p-Value	Covariate Remarks
515	1.15 (0.97,1.35)**	0.104**	INIT*AGE (p=0.006) DC (p=0.336)

^a Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^b Relative risk for a twofold increase in initial dioxin.

** Log₂ (initial dioxin)-by-covariate interaction (p≤0.05); adjusted relative risk, confidence interval, and p-value derived from a model fitted after deletion of this interaction; refer to Appendix Table I-4-21 for further analysis of this interaction.

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED				
Dioxin Category	n	Adj. Relative Risk (95% C.I.) ^{ab}	p-Value	Covariate Remarks
Comparison	1,025			RACE (p=0.988) ALC (p=0.095) AGE*DRKYR (0.021)
Background RH	362	0.94 (0.72,1.23)	0.646	
Low RH	251	1.01 (0.74,1.38)	0.942	
High RH	251	1.42 (1.02,1.98)	0.038	
Low plus High RH	502	1.19 (0.93,1.53)	0.165	

^a Relative risk and confidence interval relative to Comparisons.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

Note: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table I-3-40.
Analysis of C₃ Complement (mg/dl)
(Continuous)
Occupation Removed from Final Model

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED					
Dioxin Category	n	Adj. Mean ^{ab}	Difference of Adj. Mean vs. Comparisons (95% C.I.) ^c	p-Value ^d	Covariate Remarks
Comparison	1,043	116.54			AGE (p=0.010) RACE (p=0.001) DC (p=0.002)
Background RH	369	113.79	-2.75 --	0.007	
Low RH	257	117.61	1.07 --	0.364	
High RH	258	118.72	2.18 --	0.069	
Low plus High RH	515	118.16	1.62 --	0.077	

^a Transformed from natural logarithm scale.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^c Difference of adjusted means after transformation to original scale; confidence interval on difference of adjusted means not presented because analysis was performed on natural logarithm scale.

^d P-value is based on difference of means on natural logarithm scale.

Note: RH = Ranch Hand.

Comparison: Current Dioxin \leq 10 ppt.

Background (Ranch Hand): Current Dioxin \leq 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin \leq 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table I-3-40. (Continued)
Analysis of C₃ Complement (mg/dl)
(Continuous)
Occupation Removed from Final Model

b) MODELS 4, 5, AND 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED							
Model ^b	Current Dioxin Category Adjusted Mean ^a /(n)			Analysis Results for Log ₂ (Current Dioxin + 1)			
	Low	Medium	High	R ²	Adj. Slope (Std. Error) ^c	p-Value	Covariate Remarks
4	112.13 (287)	116.03 (290)	120.73 (287)	0.068	0.0243 (0.0035)	<0.001	AGE (p=0.024) RACE (p=0.029) DRKYR*IC (p=0.038)
5	112.02 (294)	116.58 (297)	121.99 (293)	0.087	0.0246 (0.0029)	<0.001	AGE (p=0.022) RACE (p=0.008) IC (p=0.134)
6 ^d	114.05 (289)	116.75 (290)	120.08 (284)	0.139	0.0162 (0.0031)	<0.001	AGE (p=0.096) RACE (p=0.005) DRKYR*IC (p=0.028)

^a Transformed from natural logarithm scale.

^b Model 4: Log₂ (lipid-adjusted current dioxin + 1).

Model 5: Log₂ (whole-weight current dioxin + 1).

Model 6: Log₂ (whole-weight current dioxin + 1), adjusted for log₂ total lipids.

^c Slope and standard error based on natural logarithm of C₃ complement versus log₂ (current dioxin + 1).

^d Adjusted for log₂ total lipids in addition to covariates specified under "Covariate Remarks" column.

Note: Model 4: Low = ≤ 8.1 ppt; Medium = >8.1-20.5 ppt; High = >20.5 ppt.

Models 5 and 6: Low = ≤ 46 ppq; Medium = >46-128 ppq; High = >128 ppq.

Table I-3-41.
Analysis of C₃ Complement
(Discrete)
Occupation Removed from Final Model

a) MODELS 4, 5, AND 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED				
Model ^a	Analysis Results for Log ₂ (Current Dioxin + 1)			
	n	Adj. Relative Risk (95% C.I.) ^b	p-Value	Covariate Remarks
4	875	0.64 (0.46,0.89)**	0.006**	CURR*ALC (p=0.014) DC (p=0.645) AGE (p=0.153)
5	875	0.66 (0.52,0.83)	<0.001	AGE (p=0.572) DC (p=0.113) IC*ALC (p=0.049)
6 ^c	874	0.82 (0.62,1.08)	0.162	AGE (p=0.707) DC (p=0.128) IC*ALC (p=0.039)

^a Model 4: Log₂ (lipid-adjusted current dioxin + 1).
Model 5: Log₂ (whole-weight current dioxin + 1).
Model 6: Log₂ (whole-weight current dioxin + 1), adjusted for log₂ total lipids.

^b Relative risk for a twofold increase in current dioxin.

^c Adjusted for log₂ total lipids in addition to covariates specified under "Covariate Remarks" column.

** Log₂ (current dioxin + 1)-by-covariate interaction (0.01 < p ≤ 0.05); adjusted relative risk, confidence interval, and p-value derived after deletion of this interaction; refer to Appendix Table I-4-22 for further analysis of this interaction.

Table I-3-42.
Analysis of C₄ Complement (mg/dl)
(Continuous)
Occupation Removed from Final Model

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED						
Initial Dioxin Category Summary Statistics			Analysis Results for Log ₂ (Initial Dioxin) ^b			
Initial Dioxin	n	Adj. Mean ^{ab}	R ²	Adj. Slope (Std. Error) ^c	p-Value	Covariate Remarks
Low	171	22.38	0.025	0.0031 (0.0089)	0.727	AGE (p=0.532)
Medium	167	23.20				RACE (p=0.018)
High	170	23.18				ALC (p=0.263) IC (p=0.211)

^a Transformed from natural logarithm scale.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^c Slope and standard error based on natural logarithm of C₄ complement versus log₂ (initial dioxin).

Note: Low = 39-98 ppt; Medium = >98-232 ppt; High = >232 ppt.

Table I-3-42. (Continued)
Analysis of C₄ Complement (mg/dl)
(Continuous)
Occupation Removed from Final Model

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY – ADJUSTED					
Dioxin Category	n	Adj. Mean^{ab}	Difference of Adj. Mean vs. Comparisons (95% C.I.)^c	p-Value^d	Covariate Remarks
Comparison	1,025	23.16			AGE (p=0.349) RACE (p<0.001) DRKYR (p=0.044)
Background RH	362	22.77	-0.39 --	0.255	
Low RH	251	23.27	0.11 --	0.784	
High RH	251	23.14	-0.02 --	0.961	
Low plus High RH	502	23.20	0.04 --	0.884	

^a Transformed from natural logarithm scale.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^c Difference of adjusted means after transformation to original scale; confidence interval on difference of adjusted means not presented because analysis was performed on natural logarithm scale.

^d P-value is based on difference of means on natural logarithm scale.

Note: RH = Ranch Hand.

Comparison: Current Dioxin \leq 10 ppt.

Background (Ranch Hand): Current Dioxin \leq 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin \leq 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table I-3-42. (Continued)
Analysis of C₄ Complement (mg/dl)
(Continuous)
Occupation Removed from Final Model

c) MODELS 4, 5, AND 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED							
Model ^b	Current Dioxin Category Adjusted Mean ^a /(n)			Analysis Results for Log ₂ (Current Dioxin + 1)			
	Low	Medium	High	R ²	Adj. Slope (Std. Error) ^c	p-Value	Covariate Remarks
4	22.33 (287)	22.80 (290)	23.10 (287)	0.026	0.0100 (0.0057)	0.080	RACE (p=0.001) IC (p=0.084) ALC*DRKYR (p=0.047)
5	22.19 (290)	22.68 (290)	23.45 (284)	0.032	0.0140 (0.0049)	0.004	RACE (p<0.001) IC (p=0.116) ALC*DRKYR (p=0.034)
6 ^d	22.79 (289)	22.87 (290)	23.09 (284)	0.065	0.0034 (0.0052)	0.516	RACE (p<0.001) IC (p=0.074) ALC*DRKYR (p=0.041)

^a Transformed from natural logarithm scale.

^b Model 4: Log₂ (lipid-adjusted current dioxin + 1).

Model 5: Log₂ (whole-weight current dioxin + 1).

Model 6: Log₂ (whole-weight current dioxin + 1), adjusted for log₂ total lipids.

^c Slope and standard error based on natural logarithm of C₄ complement versus log₂ (current dioxin + 1).

^d Adjusted for log₂ total lipids in addition to covariates specified under "Covariate Remarks" column.

Note: Model 4: Low = ≤ 8.1 ppt; Medium = >8.1-20.5 ppt; High = >20.5 ppt.

Models 5 and 6: Low = ≤ 46 ppq; Medium = >46-128 ppq; High = >128 ppq.

Table I-3-43.
Analysis of C₄ Complement
(Discrete)
Occupation Removed from Final Model

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED				
Dioxin Category	n	Adj. Relative Risk (95% C.I.) ^{ab}	p-Value	Covariate Remarks
Comparison	1,027			ALC (p=0.148)
Background RH	367	0.99 (0.26,3.82)	0.992	
Low RH	254	0.97 (0.20,4.65)	0.973	
High RH	254	0.50 (0.06,4.03)	0.511	
Low plus High RH	508	0.74 (0.19,2.84)	0.659	

^a Relative risk and confidence interval relative to Comparisons.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

Note: RH = Ranch Hand.

Comparison: Current Dioxin \leq 10 ppt.

Background (Ranch Hand): Current Dioxin \leq 10 ppt.

Low (Ranch Hand): Current Dioxin $>$ 10 ppt, 10 ppt $<$ Initial Dioxin \leq 143 ppt.

High (Ranch Hand): Current Dioxin $>$ 10 ppt, Initial Dioxin $>$ 143 ppt.

Table I-3-44.
Analysis of Haptoglobin (mg/dl)
(Continuous)
Occupation Removed from Final Model

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED						
Initial Dioxin Category Summary Statistics			Analysis Results for Log ₂ (Initial Dioxin) ^a			
Initial Dioxin	n	Adj. Mean [*]	R ²	Adj. Slope (Std. Error)	p-Value	Covariate Remarks
Low	170	103.04**	0.047	1.8653 (1.5912)**	0.242**	INIT*AGE (p=0.011) INIT*DRKYR (p=0.018) RACE (p=0.058)
Medium	165	112.03**				
High	167	113.74**				

^a Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

** Log₂ (initial dioxin)-by-covariate interaction (0.01 < p ≤ 0.05); adjusted mean, adjusted slope, standard error, and p-value derived from a model fitted after deletion of this interaction; refer to Appendix Table I-4-23 for further analysis of this interaction.

Note: Low = 39-98 ppt; Medium = >98-232 ppt; High = >232 ppt.

Table I-3-44. (Continued)
Analysis of Haptoglobin (mg/dl)
(Continuous)
Occupation Removed from Final Model

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED					
Dioxin Category	n	Adj. Mean^a	Difference of Adj. Mean vs. Comparisons (95% C.I.)	p-Value	Covariate Remarks
Comparison	1,025	103.82			RACE (p=0.051) AGE*DRKYR (p=0.021) ALC*DRKYR (p=0.003) ALC*IC (p=0.023) ALC*DC (p=0.027)
Background RH	362	106.25	2.43 (-2.96,7.83)	0.377	
Low RH	251	106.05	2.24 (-3.90,8.37)	0.475	
High RH	251	113.18	9.36 (3.16,15.56)	0.003	
Low plus High RH	502	109.62	5.80 (1.05,10.55)	0.017	

^a Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

Note: RH = Ranch Hand.

Comparison: Current Dioxin \leq 10 ppt.

Background (Ranch Hand): Current Dioxin \leq 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin \leq 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table I-3-44. (Continued)
Analysis of Haptoglobin (mg/dl)
(Continuous)
Occupation Removed from Final Model

c) MODELS 4, 5, AND 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED							
Model ^a	Current Dioxin Category Adjusted Mean/(n)			Analysis Results for Log ₂ (Current Dioxin + 1)			
	Low	Medium	High	R ²	Adj. Slope (Std. Error)	p-Value	Covariate Remarks
4	105.24 (287)	105.78 (290)	110.33 (287)	0.033	0.9483 (1.0643)	0.373	AGE (p=0.032) RACE (p=0.087) DRKYR (p=0.023) IC (p=0.140) DC (p<0.001)
5	106.19 (290)	103.67 (290)	112.81 (284)	0.034	0.9364 (0.9071)	0.302	AGE (p=0.031) RACE (p=0.089) DRKYR (p=0.023) IC (p=0.139) DC (p<0.001)
6 ^b	107.42 (289)	104.16 (290)	111.98 (284)	0.038	0.4269 (0.9788)	0.663	AGE (p=0.051) RACE (p=0.116) DRKYR (p=0.028) IC (p=0.143) DC (p<0.001)

^a Model 4: Log₂ (lipid-adjusted current dioxin + 1).

Model 5: Log₂ (whole-weight current dioxin + 1).

Model 6: Log₂ (whole-weight current dioxin + 1), adjusted for log₂ total lipids.

^b Adjusted for log₂ total lipids in addition to covariates specified under "Covariate Remarks" column.

Note: Model 4: Low = ≤ 8.1 ppt; Medium = >8.1-20.5 ppt; High = >20.5 ppt.

Models 5 and 6: Low = ≤ 46 ppq; Medium = >46-128 ppq; High = >128 ppq.

Table I-3-45.
Analysis of Haptoglobin
(Discrete)
Occupation Removed from Final Model

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED			
Analysis Results for Log_e (Initial Dioxin)^a			
n	Adj. Relative Risk (95% C.I.)^b	p-Value	Covariate Remarks
502	1.04 (0.86,1.27)	0.918	RACE (p=0.134) DRKYR (p=0.011)

^a Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^b Relative risk for a twofold increase in initial dioxin.

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED				
Dioxin Category	n	Adj. Relative Risk (95% C.I.)^{ab}	p-Value	Covariate Remarks
Comparison	1,025			AGE (p=0.003) DC (p=0.028) IC (p=0.323) ALC*DRKYR (p=0.050)
Background RH	362	1.07 (0.73,1.57)	0.713	
Low RH	251	0.94 (0.60,1.47)	0.790	
High RH	251	1.47 (0.98,2.22)	0.065	
Low plus High RH	502	1.18 (0.85,1.65)	0.312	

^a Relative risk and confidence interval relative to Comparisons.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

Note: RH = Ranch Hand.

Comparison: Current Dioxin \leq 10 ppt.

Background (Ranch Hand): Current Dioxin \leq 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin \leq 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table I-3-45. (Continued)
Analysis of Haptoglobin
(Discrete)
Occupation Removed from Final Model

c) MODELS 4, 5, AND 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED				
Model ^a	Analysis Results for Log ₂ (Current Dioxin + 1)			
	n	Adj. Relative Risk (95% C.I.) ^b	p-Value	Covariate Remarks
4	864	0.99 (0.86,1.14)	0.882	AGE (p=0.188) DRKYR (p=0.004)
5	864	1.02 (0.91,1.16)	0.706	AGE (p=0.137) ALC*DRKYR (p=0.049)
6 ^c	863	0.96 (0.84,1.09)	0.517	AGE (p=0.229) DRKYR (p=0.005)

^a Model 4: Log₂ (lipid-adjusted current dioxin + 1).

Model 5: Log₂ (whole-weight current dioxin + 1).

Model 6: Log₂ (whole-weight current dioxin + 1), adjusted for log₂ total lipids.

^b Relative risk for a twofold increase in current dioxin.

^c Adjusted for log₂ total lipids in addition to covariates specified under "Covariate Remarks" column.

Table I-3-46.
Analysis of Transferrin (mg/dl)
(Continuous)
Occupation Removed from Final Model

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED						
Initial Dioxin Category Summary Statistics			Analysis Results for Log ₂ (Initial Dioxin) ^b			
Initial Dioxin	n	Adj. Mean ^{ab}	R ²	Adj. Slope (Std. Error) ^c	p-Value	Covariate Remarks
Low	171	295.90	0.016	0.0040 (0.0045)	0.384	ALC (p=0.073) DC (p=0.100) IC (p=0.824)
Medium	167	295.07				
High	170	299.83				

^a Transformed from natural logarithm scale.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^c Slope and standard error based on natural logarithm of transferrin versus log₂ (initial dioxin).

Note: Low = 39-98 ppt; Medium = >98-232 ppt; High = >232 ppt.

Table I-3-46. (Continued)
Analysis of Transferrin (mg/dl)
(Continuous)
Occupation Removed from Final Model

b) MODELS 4, 5, AND 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED							
Model ^b	Current Dioxin Category Adjusted Mean ^a /(n)			Analysis Results for Log ₂ (Current Dioxin + 1)			
	Low	Medium	High	R ²	Adj. Slope (Std. Error) ^c	p-Value	Covariate Remarks
4	290.51 (287)	291.92 (290)	296.60 (287)	0.031	0.0090 (0.0032)	0.005	ALC*RACE (p=0.023) DRKYR*DC (p=0.049)
5	289.51 (290)	292.80 (290)	298.72 (284)	0.037	0.0098 (0.0027)	<0.001	ALC*RACE (p=0.026) DRKYR*DC (p=0.042)
6 ^d	291.76 (289)	292.98 (290)	296.89 (284)	0.046	0.0067 (0.0029)	0.022	ALC*RACE (p=0.039) DRKYR*DC (p=0.042)

^a Transformed from natural logarithm scale.

^b Model 4: Log₂ (lipid-adjusted current dioxin + 1).

Model 5: Log₂ (whole-weight current dioxin + 1).

Model 6: Log₂ (whole-weight current dioxin + 1), adjusted for log₂ total lipids.

^c Slope and standard error based on natural logarithm of transferrin versus log₂ (current dioxin + 1).

^d Adjusted for log₂ total lipids in addition to covariates specified under "Covariate Remarks" column.

Note: Model 4: Low = ≤ 8.1 ppt; Medium = >8.1-20.5 ppt; High = >20.5 ppt.

Models 5 and 6: Low = ≤ 46 ppq; Medium = >46-128 ppq; High = >128 ppq.

Table I-3-47.
Analysis of Transferrin
(Discrete)
Occupation Removed from Final Model

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED			
Analysis Results for Log₂ (Initial Dioxin)^a			
n	Adj. Relative Risk (95% C.I.)^b	p-Value	Covariate Remarks
508	0.92 (0.73,1.16)	0.458	DC (p=0.398) ALC (p=0.127)

^a Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^b Relative risk for a twofold increase in initial dioxin.

b) MODELS 4, 5, AND 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED				
Analysis Results for Log₂ (Current Dioxin + 1)				
Model^a	n	Adj. Relative Risk (95% C.I.)^b	p-Value	Covariate Remarks
4	864	0.88 (0.75,1.03)	0.111	IC*DRKYR (p=0.024) AGE*DC (p=0.006) DC*DRKYR (p<0.001)
5	864	0.90 (0.78,1.02)	0.102	IC*DRKYR (p=0.024) AGE*DC (p=0.006) DC*DRKYR (p<0.001)
6 ^c	863	0.89 (0.77,1.02)	0.098	IC*DRKYR (p=0.024) AGE*DC (p=0.006) DC*DRKYR (p<0.001)

^a Model 4: Log₂ (lipid-adjusted current dioxin + 1).
Model 5: Log₂ (whole-weight current dioxin + 1).
Model 6: Log₂ (whole-weight current dioxin + 1), adjusted for log₂ total lipids.

^b Relative risk for a twofold increase in current dioxin.

^c Adjusted for log₂ total lipids in addition to covariates specified under "Covariate Remarks" column.

APPENDIX I-4.

Interaction Tables for the Gastrointestinal Assessment Occupation Removed from Final Model

This appendix contains exposure analyses results of interactions between covariates and dioxin after occupation has been removed from those final dioxin models (Models 2 through 6) that contained occupation. These tables are supplements to tables in Appendix I-3, which are main effects results with occupation removed from the model. Results are presented for separate strata of the covariate and include sample sizes, percent abnormal, relative risks, confidence intervals, and p-values. Chapter 7, Statistical Methods, provides further details on the analytical approaches used in the interaction analyses. The analysis model, covariate involved in the interaction, and a reference to the analysis table in Chapter 13, Gastrointestinal Assessment, are given in the heading of each subtable. A summary of the interactions described in this appendix follows.

Appendix I-4 Table	Chapter 13 Table	Appendix I-3 Table	Dependent Variable	Model	Covariate
I-4-1	13-6	I-3-2	Alcoholic Chronic Liver Disease and Cirrhosis	3	Race
I-4-2	13-9	I-3-3	Other Liver Disorders	4 5 6	Degreasing Chemical Exposure Degreasing Chemical Exposure Degreasing Chemical Exposure
I-4-3	13-12	I-3-5	AST (Continuous)	2 4 5 6	Current Alcohol Use Current Alcohol Use Current Alcohol Use Current Alcohol Use
I-4-4	13-13	I-3-6	AST (Discrete)	4 5 6	Current Alcohol Use Current Alcohol Use Current Alcohol Use
I-4-5	13-16	I-3-9	GGT (Continuous)	2	Degreasing Chemical Exposure
I-4-6	13-18	I-3-10	Alkaline Phosphatase (Continuous)	2 3 5 6	Degreasing Chemical Exposure Degreasing Chemical Exposure Race Race
I-4-7	13-23	I-3-14	LDH (Continuous)	3	Age, Race, Lifetime Alcohol History
I-4-8	13-24	I-3-15	LDH (Discrete)	3	Lifetime Alcohol History
I-4-9	13-26	I-3-17	Cholesterol (Discrete)	3	Current Alcohol Use

Appendix I-4 Table	Chapter 13 Table	Appendix I-3 Table	Dependent Variable	Model	Covariate
I-4-10	13-27	I-3-18	HDL Cholesterol (Continuous)	3 4 5 6	Current Alcohol Use, Lifetime Alcohol History Lifetime Alcohol History Lifetime Alcohol History, Degreasing Chemical Exposure
I-4-11	13-29	I-3-19	Cholesterol-HDL Ratio (Continuous)	2 3	Current Alcohol Use Current Alcohol Use
I-4-12	13-31	I-3-21	Triglycerides (Continuous)	5 6	Lifetime Alcohol History Lifetime Alcohol History
I-4-13	13-33	I-3-23	Creatine Kinase (Continuous)	3	Race and Lifetime Alcohol History
I-4-14	13-34	I-3-24	Creatine Kinase (Discrete)	3	Race, Lifetime Alcohol History
I-4-15	13-36	I-3-26	Serum Amylase (Discrete)	3	Race
I-4-16	13-38	I-3-28	Serological Evidence of Prior Hepatitis B Infection	3	Age
I-4-17	13-41	I-3-30	Prealbumin (Continuous)	3 5	Industrial Chemical Exposure Degreasing Chemical Exposure
I-4-18	13-43	I-3-31	Albumin (Continuous)	4 5 6	Degreasing Chemical Exposure Degreasing Chemical Exposure Degreasing Chemical Exposure
I-4-19	13-45	I-3-32	α -1 Acid Glycoprotein (Continuous)	2 3 4	Lifetime Alcohol History Lifetime Alcohol History Lifetime Alcohol History
I-4-20	13-47	I-3-34	α -1 Antitrypsin (Continuous)	2 4 5 6	Industrial Chemical Exposure, Degreasing Chemical Exposure Degreasing Chemical Exposure Degreasing Chemical Exposure Degreasing Chemical Exposure
I-4-21	13-52	I-3-39	Apolipoprotein B (Discrete)	2	Age
I-4-22	13-54	I-3-41	C ₃ Complement (Discrete)	4	Current Alcohol Use
I-4-23	13-57	I-3-44	Haptoglobin (Continuous)	2	Age, Lifetime Alcohol History

Table I-4-1.
Interaction Table for Alcoholic Chronic Liver Disease and Cirrhosis
Occupation Removed from Final Model

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Race: Tables 13-6 and I-3-2)					
Stratum	Dioxin Category	n	Percent Yes	Adjusted Relative Risk (95% C.I.)^a	p-Value
Non-Black	Comparison	938	5.8		
	Background RH	334	5.7	1.05 (0.60,1.86)	0.856
	Low RH	218	4.6	0.74 (0.36,1.52)	0.409
	High RH	217	6.5	1.00 (0.51,1.93)	0.990
	Low plus High RH	435	5.5	0.87 (0.52,1.47)	0.601
Black	Comparison	49	12.2		
	Background RH	13	0.0	--	--
	Low RH	21	19.0	1.42 (0.31,6.42)	0.649
	High RH	11	0.0	--	--
	Low plus High RH	32	12.5	0.66 (0.15,3.00)	0.591

^a Relative risk and confidence interval relative to Comparisons.

--: Adjusted relative risk, confidence interval, and p-value not presented due to the sparse number of abnormalities.

Note: Model 3: RH = Ranch Hand.

Comparison: Current Dioxin \leq 10 ppt.

Background (Ranch Hand): Current Dioxin \leq 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin \leq 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table I-4-2.
Interaction Table for Other Liver Disorders
Occupation Removed from Final Model

a) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Degreasing Chemical Exposure: Tables 13-9 and I-3-3)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent Yes	Adjusted Relative Risk (95% C.I.) ^a	p-Value
No	Low	153	20.3	1.38 (1.14,1.65)	0.001
	Medium	109	28.4		
	High	63	41.3		
Yes	Low	137	27.7	1.05 (0.92,1.19)	0.487
	Medium	182	30.8		
	High	227	31.3		

b) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Degreasing Chemical Exposure: Tables 13-9 and I-3-3)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent Yes	Adjusted Relative Risk (95% C.I.) ^a	p-Value
No	Low	147	19.7	1.33 (1.13,1.56)	0.001
	Medium	114	28.1		
	High	64	42.2		
Yes	Low	147	28.6	1.05 (0.94,1.18)	0.353
	Medium	175	29.7		
	High	224	31.7		

Table I-4-2. (Continued)
Interaction Table for Other Liver Disorders
Occupation Removed from Final Model

c) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Degreasing Chemical Exposure: Tables I3-9 and I-3-3)					
Current Dioxin Category Summary Statistics				Analysis Results for Log _e (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent Yes	Adjusted Relative Risk (95% C.I.) ^a	p-Value
No	Low	147	19.7	1.29 (1.09,1.52)	0.003
	Medium	114	28.1		
	High	64	42.2		
Yes	Low	146	28.8	1.02 (0.90,1.14)	0.773
	Medium	175	29.7		
	High	224	31.7		

^a Relative risk for a twofold increase in current dioxin.

Note: Model 4: Low = ≤ 8.1 ppt; Medium = $>8.1-20.5$ ppt; High = >20.5 ppt.

Models 5 and 6: Low = ≤ 46 ppq; Medium = $> 46-128$ ppq; High = > 128 ppq.

Table I-4-3.
Interaction Table for AST (U/L)
(Continuous)
Occupation Removed from Final Model

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Current Alcohol Use: Tables 13-12 and I-3-5)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log _e (Initial Dioxin)	
Stratum	Initial Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
0-1 Drinks/Day	Low	129	21.99	-0.0032 (0.0138)	0.817
	Medium	134	22.78		
	High	139	22.08		
>1-4 Drinks/Day	Low	40	23.51	0.0674 (0.0294)	0.022
	Medium	29	25.98		
	High	29	28.02		
>4 Drinks/Day	Low	2	22.28	0.2664 (0.1082)	0.014
	Medium	4	31.01		
	High	2	58.97		

b) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Current Alcohol Use: Tables 13-12 and I-3-5)					
Current Dioxin Category Summary Statistics				Analysis Results for Log _e (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
0-1 Drinks/Day	Low	224	22.17	0.0013 (0.0095)	0.890
	Medium	217	22.64		
	High	236	22.02		
>1-4 Drinks/Day	Low	56	24.29	0.0248 (0.0213)	0.244
	Medium	70	27.14		
	High	45	24.39		
>4 Drinks/Day	Low	7	20.68	0.1953 (0.0644)	0.003
	Medium	3	21.41		
	High	6	35.83		

Table I-4-3. (Continued)
Interaction Table for AST (U/L)
(Continuous)
Occupation Removed from Final Model

c) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Current Alcohol Use: Tables 13-12 and I-3-5)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
0-1 Drinks/Day	Low	227	22.05	0.0022 (0.0082)	0.783
	Medium	219	22.52		
	High	231	22.28		
> 1-4 Drinks/Day	Low	57	24.31	0.0277 (0.0183)	0.130
	Medium	67	26.06		
	High	47	26.09		
> 4 Drinks/Day	Low	6	20.39	0.1298 (0.0469)	0.006
	Medium	4	21.82		
	High	6	36.28		

d) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Current Alcohol Use: Tables 13-12 and I-3-5)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
0-1 Drinks/Day	Low	226	22.20	-0.0011 (0.0088)	0.902
	Medium	219	22.57		
	High	231	22.09		
> 1-4 Drinks/Day	Low	57	24.49	0.0234 (0.0186)	0.208
	Medium	67	26.01		
	High	47	25.84		
> 4 Drinks/Day	Low	6	20.40	0.1279 (0.0469)	0.007
	Medium	4	21.51		
	High	6	35.80		

^a Transformed from natural logarithm scale.

^b Slope and standard error based on natural logarithm of AST versus log₂ dioxin.

Note: Model 2: Low = 39-98 ppt; Medium = > 98-232 ppt; High = > 232 ppt.

Model 4: Low = ≤ 8.1 ppt; Medium = > 8.1-20.5 ppt; High = > 20.5 ppt.

Models 5 and 6: Low = ≤ 46 ppq; Medium = > 46-128 ppq; High = > 128 ppq.

RESERVED

Table I-4-4. (Continued)
Interaction Table for AST
(Discrete)
Occupation Removed from Final Model

c) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Current Alcohol Use: Tables 13-13 and I-3-6)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.) ^a	p-Value
0-1 Drinks/Day	Low	226	0.9	0.81 (0.53,1.24)	0.333
	Medium	219	1.4		
	High	231	0.9		
>1 Drinks/Day	Low	63	3.2	1.15 (0.80,1.67)	0.445
	Medium	71	9.9		
	High	53	11.3		

^a Relative risk for a twofold increase in current dioxin.

Note: Model 4: Low = ≤ 8.1 ppt; Medium = > 8.1-20.5 ppt; High = > 20.5 ppt.

Models 5 and 6: Low = ≤ 46 ppq; Medium = > 46-128 ppq; High = > 128 ppq.

Table I-4-5.
Interaction Table for GGT (U/L)
(Continuous)
Occupation Removed from Final Model

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Degreasing Chemical Exposure: Tables 13-16 and I-3-9)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Initial Dioxin)	
Stratum	Initial Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
No	Low	66	33.10	0.0806 (0.0404)	0.046
	Medium	46	35.05		
	High	31	46.38		
Yes	Low	104	34.59	-0.0144 (0.0257)	0.575
	Medium	119	37.20		
	High	136	33.36		

^a Transformed from natural logarithm scale.

^b Slope and standard error based on natural logarithm of GGT versus log₂ dioxin.

Note: Model 2: Low = 39-98 ppt; Medium = > 98-232 ppt; High = > 232 ppt.

Table I-4-6.
Interaction Table for Alkaline Phosphatase (U/L)
(Continuous)
Occupation Removed from Final Model

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Degreasing Chemical Exposure: Tables 13-18 and I-3-10)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log _e (Initial Dioxin)	
Stratum	Initial Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
No	Low	67	66.72	0.0363 (0.0154)	0.019
	Medium	46	69.60		
	High	32	74.46		
Yes	Low	106	73.12	-0.0113 (0.0098)	0.249
	Medium	124	74.24		
	High	140	71.42		

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Degreasing Chemical Exposure: Tables 13-18 and I-3-10)					
Stratum	Dioxin Category	n	Adjusted Mean ^a	Difference of Adjusted Mean vs. Comparisons (95% C.I.) ^c	p-Value ^d
No	Comparison	366	68.31		
	Background RH	176	66.49	-1.81 --	0.246
	Low RH	94	67.16	-1.15 --	0.564
	High RH	51	71.40	3.10 --	0.243
	Low plus High RH	145	68.62	0.32 --	0.856
Yes	Comparison	661	67.61		
	Background RH	190	71.55	3.94 --	0.007
	Low RH	160	73.78	6.18 --	<0.001
	High RH	203	70.76	3.15 --	0.025
	Low plus High RH	363	72.08	4.47 --	<0.001

RESERVED

Table I-4-7.
Interaction Table for LDH (U/L)
(Continuous)
Occupation Removed from Final Model

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Age: Tables 13-23 and I-3-14)					
Stratum	Dioxin Category	n	Adjusted Mean^a	Difference of Adjusted Mean vs. Comparisons (95% C.I.)^b	p-Value^c
Born ≥ 1942	Comparison	438	145.32		
	Background RH	125	147.03	1.71 --	0.518
	Low RH	82	149.14	3.81 --	0.224
	High RH	149	147.06	1.73 --	0.481
	Low plus High RH	231	147.79	2.47 --	0.242
Born < 1942	Comparison	586	150.03		
	Background RH	237	148.40	-1.63 --	0.424
	Low RH	169	147.91	-2.12 --	0.357
	High RH	102	148.30	-1.73 --	0.542
	Low plus High RH	271	148.05	-1.97 --	0.309

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Race: Tables 13-23 and I-3-14)					
Stratum	Dioxin Category	n	Adjusted Mean^a	Difference of Adjusted Mean vs. Comparisons (95% C.I.)^b	p-Value^c
Black	Comparison	52	156.88		
	Background RH	15	137.17	-19.71 --	0.009
	Low RH	20	150.23	-6.66 --	0.349
	High RH	12	146.50	-10.38 --	0.225
	Low plus High RH	32	148.82	-8.06 --	0.182
Non-Black	Comparison	972	145.09		
	Background RH	347	145.48	0.39 --	0.808
	Low RH	231	145.28	0.19 --	0.919
	High RH	239	146.05	0.96 --	0.607
	Low plus High RH	470	145.67	0.58 --	0.686

Table I-4-7. (Continued)
Interaction Table for LDH (U/L)
(Continuous)
Occupation Removed from Final Model

c) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Lifetime Alcohol History: Tables 13-23 and I-3-14)					
Stratum	Dioxin Category	n	Adjusted Mean ^a	Difference of Adjusted Mean vs. Comparisons (95% C.I.) ^b	p-Value ^c
0 Drink-years	Comparison	53	147.17		
	Background RH	20	136.21	-10.96 --	0.094
	Low RH	15	153.56	6.39 --	0.409
	High RH	24	145.40	-1.77 --	0.779
	Low plus High RH	39	148.49	1.31 --	0.810
> 0-40 Drink-years	Comparison	696	149.78		
	Background RH	258	148.45	-1.33 --	0.490
	Low RH	169	148.31	-1.47 --	0.514
	High RH	164	148.91	-0.87 --	0.706
	Low plus High RH	333	148.60	-1.17 --	0.503
> 40 Drink-years	Comparison	275	144.78		
	Background RH	84	148.68	3.90 --	0.227
	Low RH	67	146.34	1.56 --	0.656
	High RH	63	149.61	4.83 --	0.183
	Low plus High RH	130	147.92	3.13 --	0.253

^a Transformed from natural logarithm scale.

^b Difference of means after transformation to original scale; confidence interval on difference of means not presented because analysis was performed on natural logarithm scale.

^c P-value is based on difference of means on natural logarithm scale.

Note: RH = Ranch Hand.

Comparison: Current Dioxin \leq 10 ppt.

Background (Ranch Hand): Current Dioxin \leq 10 ppt.

Low (Ranch Hand): Current Dioxin $>$ 10 ppt, 10 ppt $<$ Initial Dioxin \leq 143 ppt.

High (Ranch Hand): Current Dioxin $>$ 10 ppt, Initial Dioxin $>$ 143 ppt.

Table I-4-8.
Interaction Table for LDH
(Discrete)
Occupation Removed from Final Model

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Lifetime Alcohol History: Tables 13-24 and I-3-15)					
Stratum	Dioxin Category	n	Percent High	Adjusted Relative Risk (95% C.I.) ^a	p-Value
0-40 Drink-years	Comparison	749	15.5		
	Background RH	278	12.2	0.86 (0.56,1.30)	0.466
	Low RH	184	12.5	0.71 (0.44,1.16)	0.176
	High RH	188	14.9	0.92 (0.58,1.45)	0.719
	Low plus High RH	372	13.7	0.81 (0.57,1.17)	0.262
>40 Drink-years	Comparison	275	10.2		
	Background RH	84	16.7	2.03 (1.00,4.12)	0.050
	Low RH	67	11.9	1.22 (0.52,2.85)	0.650
	High RH	63	19.0	1.80 (0.83,3.89)	0.134
	Low plus High RH	130	15.4	1.50 (0.79,2.83)	0.212

^a Relative risk and confidence interval relative to Comparisons.

Note: RH = Ranch Hand.

Comparison: Current Dioxin \leq 10 ppt.

Background (Ranch Hand): Current Dioxin \leq 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin \leq 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

RESERVED

Table I-4-10.
Interaction Table for HDL Cholesterol (mg/dl)
(Continuous)
Occupation Removed from Final Model

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Current Alcohol Use: Tables 13-27 and I-3-18)					
Stratum	Dioxin Category	n	Adjusted Mean ^a	Difference of Adjusted Mean vs. Comparisons (95% C.I.) ^b	p-Value ^c
0-1 Drinks/Day	Comparison	806	41.58		
	Background RH	277	42.52	0.94 --	0.182
	Low RH	190	41.00	-0.57 --	0.470
	High RH	202	39.62	-1.96 --	0.010
	Low plus High RH	392	40.28	-1.29 --	0.032
>1-4 Drinks/Day	Comparison	175	46.38		
	Background RH	73	46.27	-0.11 --	0.943
	Low RH	54	47.00	0.62 --	0.720
	High RH	39	47.53	1.15 --	0.566
	Low plus High RH	93	47.22	0.84 --	0.556
>4 Drinks/Day	Comparison	35	46.79		
	Background RH	8	50.81	4.02 --	0.379
	Low RH	3	64.95	18.16 --	0.023
	High RH	5	44.29	-2.51 --	0.635
	Low plus High RH	8	51.13	4.33 --	0.353

Table I-4-10. (Continued)
Interaction Table for HDL Cholesterol (mg/dl)
(Continuous)
Occupation Removed from Final Model

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Lifetime Alcohol History: Tables 13-27 and I-3-18)					
Stratum	Dioxin Category	n	Adjusted Mean^a	Difference of Adjusted Mean vs. Comparisons (95% C.I.)^b	p-Value^c
0 Drink-years	Comparison	53	40.09		
	Background RH	20	38.73	-1.36 --	0.580
	Low RH	15	38.72	-1.37 --	0.617
	High RH	23	41.36	1.27 --	0.598
	Low plus High RH	38	40.30	0.21 --	0.918
>0-40 Drink-years	Comparison	690	42.47		
	Background RH	255	43.96	1.49 --	0.050
	Low RH	168	42.38	-0.10 --	0.910
	High RH	162	40.10	-2.37 --	0.006
	Low plus High RH	330	41.24	-1.23 --	0.066
>40 Drink-years	Comparison	273	43.05		
	Background RH	83	42.99	-0.06 --	0.964
	Low RH	64	43.89	0.85 --	0.557
	High RH	61	43.00	-0.05 --	0.974
	Low plus High RH	125	43.46	0.41 --	0.716

RESERVED

Table I-4-10. (Continued)
Interaction Table for HDL Cholesterol (mg/dl)
(Continuous)
Occupation Removed from Final Model

e) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Lifetime Alcohol History: Tables 13-27 and I-3-18)					
Current Dioxin Category Summary Statistics				Analysis Results for Log _e (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^d	p-Value
0 Drink-years	Low	18	39.48	0.0044 (0.0170)	0.795
	Medium	14	38.31		
	High	26	41.59		
> 0-40 Drink-years	Low	205	44.79	-0.0268 (0.0068)	<0.001
	Medium	199	42.26		
	High	180	40.25		
> 40 Drink-years	Low	66	42.61	0.0002 (0.0098)	0.982
	Medium	74	41.93		
	High	68	40.83		

Table I-4-10. (Continued)
Interaction Table for HDL Cholesterol (mg/dl)
(Continuous)
Occupation Removed from Final Model

f) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Degreasing Chemical Exposure: Tables 13-27 and I-3-18)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^d	p-Value
No	Low	143	45.08	-0.0347 (0.0091)	<0.001
	Medium	114	41.68		
	High	57	38.92		
Yes	Low	146	42.71	-0.0072 (0.0067)	0.285
	Medium	173	42.02		
	High	217	40.80		

^a Transformed from natural logarithm scale.

^b Difference of means after transformation to original scale; confidence interval on difference of means not presented because analysis was performed on natural logarithm scale.

^c P-value is based on difference of means on natural logarithm scale.

^d Slope and standard error based on natural logarithm of HDL cholesterol versus log₂ dioxin.

Note: Model 3: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Model 4: Low = ≤ 8.1 ppt; Medium = >8.1-20.5 ppt; High = >20.5 ppt.

Models 5 and 6: Low = ≤ 46 ppq; Medium = > 46-128 ppq; High = > 128 ppq.

Table I-4-11.
Interaction Table for Cholesterol-HDL Ratio
(Continuous)
Occupation Removed from Final Model

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Current Alcohol Use: Tables 13-29 and I-3-19)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Initial Dioxin)	
Stratum	Initial Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
0-1 Drinks/Day	Low	128	5.30	0.0181 (0.0108)	0.094
	Medium	130	5.38		
	High	134	5.50		
>1-4 Drinks/Day	Low	39	4.64	0.0427 (0.0224)	0.057
	Medium	27	4.96		
	High	27	4.89		
>4 Drinks/Day	Low	2	3.77	0.1833 (0.0815)	0.025
	Medium	4	5.68		
	High	2	6.91		

Table I-4-11. (Continued)
Interaction Table for Cholesterol-HDL Ratio
(Continuous)
Occupation Removed from Final Model

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Current Alcohol Use: Tables 13-29 and I-3-19)					
Stratum	Dioxin Category	n	Adjusted Mean^a	Difference of Adjusted Mean vs. Comparisons (95% C.I.)^c	p-Value^d
0-1 Drinks/Day	Comparison	808	5.17		
	Background RH	281	5.02	-0.15 --	0.123
	Low RH	192	5.21	0.04 --	0.744
	High RH	205	5.51	0.34 --	0.003
	Low plus High RH	397	5.36	0.19 --	0.032
>1-4 Drinks/Day	Comparison	175	4.75		
	Background RH	73	4.78	0.03 --	0.883
	Low RH	55	4.80	0.05 --	0.812
	High RH	39	4.72	-0.03 --	0.901
	Low plus High RH	94	4.77	0.02 --	0.922
>4 Drinks/Day	Comparison	35	4.77		
	Background RH	9	4.90	0.13 --	0.791
	Low RH	3	3.40	-1.37 --	0.041
	High RH	5	5.21	0.44 --	0.500
	Low plus High RH	8	4.44	-0.33 --	0.507

^a Transformed from natural logarithm scale.

^b Slope and standard error based on natural logarithm of cholesterol-HDL ratio versus log₂ dioxin.

^c Difference of means after transformation to original scale; confidence interval on difference of means not presented because analysis was performed on natural logarithm scale.

^d P-value is based on difference of means on natural logarithm scale.

Note: Model 2: Low = 39-98 ppt; Medium = > 98-232 ppt; High = > 232 ppt.

Model 3: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table I-4-12.
Interaction Table for Triglycerides (mg/dl)
(Continuous)
Occupation Removed from Final Model

a) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Lifetime Alcohol History: Tables 13-31 and I-3-21)					
Current Dioxin Category Summary Statistics				Analysis Results for Log₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean^a	Adjusted Slope (Std. Error)^b	p-Value
0 Drink-years	Low	18	111.89	0.1317 (0.0366)	<0.001
	Medium	14	109.29		
	High	27	183.07		
>0-40 Drink-years	Low	206	109.11	0.0937 (0.0142)	<0.001
	Medium	201	131.00		
	High	184	154.44		
>40 Drink-years	Low	66	106.28	0.0862 (0.0213)	<0.001
	Medium	75	127.69		
	High	73	165.76		

b) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Lifetime Alcohol History: Tables 13-31 and I-3-21)					
Current Dioxin Category Summary Statistics				Analysis Results for Log₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean^a	Adjusted Slope (Std. Error)^b	p-Value
0 Drink-years	Low	18	146.01	0.0448 (0.0301)	0.136
	Medium	14	126.05		
	High	27	161.74		
>0-40 Drink-years	Low	205	129.36	0.0198 (0.0118)	0.095
	Medium	201	137.07		
	High	184	137.38		
>40 Drink-years	Low	66	128.71	0.0137 (0.0177)	0.440
	Medium	75	137.76		
	High	73	145.76		

^a Transformed from natural logarithm scale.

^b Slope and standard error based on natural logarithm of triglycerides versus log₂ dioxin.

Note: Low = ≤ 46 ppq; Medium = > 46-128 ppq; High = > 128 ppq.

Table I-4-13.
Interaction Table for Creatine Kinase (U/L)
(Continuous)
Occupation Removed from Final Model

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Race and Lifetime Alcohol History: Tables 13-33 and I-3-23)					
Stratum	Dioxin Category	n	Adjusted Mean ^a	Difference of Adjusted Mean vs. Comparisons (95% C.I.) ^b	p-Value ^c
Black, 0 Drink-years	Comparison	5	263.14		
	Background RH	2	244.73	-18.41 --	0.865
	Low RH	1	75.10	-188.04 --	0.025
	High RH	2	125.96	-137.18 --	0.085
	Low plus High RH	3	106.02	-157.12 --	0.015
Black, >0-40 Drink-years	Comparison	38	286.51		
	Background RH	11	187.49	-99.02 --	0.016
	Low RH	11	184.79	-101.72 --	0.012
	High RH	6	177.94	-108.57 --	0.034
	Low plus High RH	17	182.35	-104.17 --	0.002
Black, >40 Drink-years	Comparison	9	224.07		
	Background RH	2	110.38	-113.69 --	0.077
	Low RH	8	279.55	55.48 --	0.373
	High RH	4	333.76	109.69 --	0.195
	Low plus High RH	12	296.56	72.49 --	0.213
Non-Black, 0 Drink-years	Comparison	48	119.68		
	Background RH	18	104.43	-15.25 --	0.335
	Low RH	14	124.26	4.58 --	0.809
	High RH	22	149.08	29.40 --	0.095
	Low plus High RH	36	138.89	19.21 --	0.187
Non-Black, >0-40 Drink-years	Comparison	658	125.38		
	Background RH	247	127.70	2.32 --	0.634
	Low RH	158	126.93	1.55 --	0.787
	High RH	158	124.50	-0.88 --	0.878
	Low plus High RH	316	125.71	0.33 --	0.941
Non-Black, >40 Drink-years	Comparison	267	117.05		
	Background RH	82	124.74	7.69 --	0.325
	Low RH	59	110.59	-6.46 --	0.440
	High RH	59	118.36	1.31 --	0.880
	Low plus High RH	118	114.41	-2.64 --	0.687

^a Transformed from natural logarithm scale.

^b Difference of means after transformation to original scale; confidence interval on difference of means not presented because analysis was performed on natural logarithm scale.

^c P-value is based on difference of means on natural logarithm scale.

Note: RH = Ranch Hand.

Comparison: Current Dioxin \leq 10 ppt.

Background (Ranch Hand): Current Dioxin \leq 10 ppt.

Low (Ranch Hand): Current Dioxin $>$ 10 ppt, 10 ppt $<$ Initial Dioxin \leq 143 ppt.

High (Ranch Hand): Current Dioxin $>$ 10 ppt, Initial Dioxin $>$ 143 ppt.

Table I-4-14.
Interaction Table for Creatine Kinase
(Discrete)
Occupation Removed from Final Model

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Race: Tables 13-34 and I-3-24)					
Stratum	Dioxin Category	n	Percent High	Adjusted Relative Risk (95% C.I.)^a	p-Value
Non-Black	Comparison	973	10.6		
	Background RH	347	12.1	1.35 (0.91,2.00)	0.137
	Low RH	231	9.5	0.83 (0.51,1.37)	0.473
	High RH	239	15.1	1.33 (0.87,2.03)	0.185
	Low plus High RH	470	12.3	1.08 (0.76,1.54)	0.651
Black	Comparison	52	67.3		
	Background RH	15	26.7	0.17 (0.04,0.67)	0.011
	Low RH	20	55.0	0.63 (0.21,1.92)	0.414
	High RH	12	33.3	0.19 (0.04,0.84)	0.028
	Low plus High RH	32	46.9	0.41 (0.16,1.08)	0.071

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Lifetime Alcohol History: Tables 13-34 and I-3-24)					
Stratum	Dioxin Category	n	Percent High	Adjusted Relative Risk (95% C.I.)^a	p-Value
0 Drink-years	Comparison	53	15.1		
	Background RH	20	10.0	0.78 (0.14,4.49)	0.784
	Low RH	15	13.3	1.19 (0.21,6.82)	0.841
	High RH	24	25.0	2.13 (0.60,7.53)	0.240
	Low plus High RH	39	20.5	1.77 (0.56,5.55)	0.327
>0-40 Drink-years	Comparison	696	13.9		
	Background RH	258	13.6	1.14 (0.74,1.78)	0.549
	Low RH	169	10.7	0.65 (0.37,1.15)	0.138
	High RH	164	14.6	1.04 (0.63,1.73)	0.876
	Low plus High RH	333	12.6	0.84 (0.56,1.26)	0.392
>40 Drink-years	Comparison	276	12.0		
	Background RH	84	10.7	1.11 (0.49,2.50)	0.810
	Low RH	67	19.4	1.34 (0.60,2.98)	0.473
	High RH	63	15.9	0.98 (0.41,2.34)	0.960
	Low plus High RH	130	17.7	1.16 (0.61,2.21)	0.653

^a Relative risk and confidence interval relative to Comparisons.

Note: RH = Ranch Hand.

Comparison: Current Dioxin \leq 10 ppt.

Background (Ranch Hand): Current Dioxin \leq 10 ppt.

Low (Ranch Hand): Current Dioxin $>$ 10 ppt, 10 ppt $<$ Initial Dioxin \leq 143 ppt.

High (Ranch Hand): Current Dioxin $>$ 10 ppt, Initial Dioxin $>$ 143 ppt.

Table I-4-15.
Interaction Table for Serum Amylase
(Discrete)
Occupation Removed from Final Model

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Race: Tables 13-36 and I-3-26)					
Stratum	Dioxin Category	n	Percent High	Adjusted Relative Risk (95% C.I.) ^a	p-Value
Non-Black	Comparison	990	7.2		
	Background RH	354	6.2	0.75 (0.45,1.24)	0.263
	Low RH	236	6.4	0.87 (0.49,1.57)	0.652
	High RH	246	2.4	0.38 (0.16,0.89)	0.026
	Low plus High RH	482	4.4	0.63 (0.38,1.05)	0.078
Black	Comparison	53	20.8		
	Background RH	15	20.0	0.89 (0.21,3.80)	0.870
	Low RH	21	14.3	0.56 (0.14,2.29)	0.418
	High RH	12	50.0	4.13 (1.08,15.79)	0.038
	Low plus High RH	33	27.3	1.36 (0.48,3.82)	0.561

^a Relative risk and confidence interval relative to Comparisons.

Note: RH = Ranch Hand.

Comparison: Current Dioxin \leq 10 ppt.

Background (Ranch Hand): Current Dioxin \leq 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin \leq 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table I-4-16.
Interaction Table for Serological Evidence of Prior Hepatitis B Infection
Occupation Removed from Final Model

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Age: Tables 13-38 and I-3-28)					
Stratum	Dioxin Category	n	Percent Yes	Adjusted Relative Risk (95% C.I.) ^a	p-Value
Born ≥ 1942	Comparison	448	13.4		
	Background RH	126	12.7	1.02 (0.56,1.87)	0.936
	Low RH	84	9.5	0.62 (0.28,1.36)	0.228
	High RH	150	10.7	0.75 (0.42,1.36)	0.347
	Low plus High RH	234	10.3	0.70 (0.42,1.16)	0.169
Born < 1942	Comparison	597	16.2		
	Background RH	241	7.9	0.47 (0.28,0.79)	0.004
	Low RH	170	10.0	0.56 (0.32,0.98)	0.040
	High RH	103	16.5	0.90 (0.51,1.60)	0.717
	Low plus High RH	273	12.5	0.69 (0.45,1.06)	0.087

^a Relative risk and confidence interval relative to Comparisons.

Note: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table I-4-17.
Interaction Table for Prealbumin (mg/dl)
(Continuous)
Occupation Removed from Final Model

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Industrial Chemical Exposure: Tables 13-41 and I-3-30)					
Stratum	Dioxin Category	n	Adjusted Mean	Difference of Adjusted Mean vs. Comparisons (95% C.I.)	p-Value
No	Comparison	416	27.83		
	Background RH	186	28.00	0.18 (-0.58,0.93)	0.649
	Low RH	104	27.09	-0.74 (-1.68,0.20)	0.124
	High RH	78	28.60	0.77 (-0.29,1.84)	0.154
	Low plus High RH	182	27.74	-0.09 (-0.85,0.67)	0.818
Yes	Comparison	609	27.61		
	Background RH	176	27.33	-0.29 (-1.03,0.45)	0.445
	Low RH	147	28.27	0.66 (-0.13,1.45)	0.102
	High RH	173	27.26	-0.36 (-1.10,0.38)	0.345
	Low plus High RH	320	27.72	0.11 (-0.48,0.70)	0.718

b) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Degreasing Chemical Exposure: Tables 13-41 and I-3-30)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean	Adjusted Slope (Std. Error)	p-Value
No	Low	143	28.47	-0.2247 (0.1565)	0.152
	Medium	115	27.98		
	High	61	27.26		
Yes	Low	147	27.15	0.2714 (0.1129)	0.016
	Medium	175	27.66		
	High	223	27.76		

Note: Model 3: RH = Ranch Hand.
Comparison: Current Dioxin ≤ 10 ppt.
Background (Ranch Hand): Current Dioxin ≤ 10 ppt.
Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 143 ppt.
High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.
Model 5: Low = ≤ 46 ppq; Medium = > 46-128 ppq; High = > 128 ppq.

Table I-4-18.
Interaction Table for Albumin (mg/dl)
(Continuous)
Occupation Removed from Final Model

a) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Degreasing Chemical Exposure: Tables 13-43 and I-3-31)					
Current Dioxin Category Summary Statistics				Analysis Results for Log₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean	Adjusted Slope (Std. Error)	p-Value
No	Low	149	3,976.42	-28.0882 (12.6389)	0.027
	Medium	111	3,865.48		
	High	62	3,914.30		
Yes	Low	140	3,876.74	10.6904 (8.8036)	0.225
	Medium	184	3,881.46		
	High	229	3,912.70		

b) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Degreasing Chemical Exposure: Tables 13-43 and I-3-31)					
Current Dioxin Category Summary Statistics				Analysis Results for Log₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean	Adjusted Slope (Std. Error)	p-Value
No	Low	143	3,966.79	-21.0426 (10.5686)	0.047
	Medium	117	3,901.05		
	High	62	3,884.48		
Yes	Low	149	3,881.25	12.4533 (7.6139)	0.102
	Medium	178	3,872.58		
	High	226	3,917.80		

Table I-4-18. (Continued)
Interaction Table for Albumin (mg/dl)
(Continuous)
Occupation Removed from Final Model

c) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Degreasing Chemical Exposure: Tables 13-43 and I-3-31)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean	Adjusted Slope (Std. Error)	p-Value
No	Low	143	3,980.04	-25.4589 (10.8169)	0.019
	Medium	117	3,904.59		
	High	62	3,877.27		
Yes	Low	148	3,891.56	8.0073 (8.0903)	0.323
	Medium	178	3,876.48		
	High	226	3,909.75		

Note: Model 4: Low = ≤ 8.1 ppt; Medium = > 8.1 -20.5 ppt; High = > 20.5 ppt.
 Models 5 and 6: Low = ≤ 46 ppq; Medium = > 46 -128 ppq; High = > 128 ppq.

Table I-4-19.
Interaction Table for α -1 Acid Glycoprotein (mg/dl)
(Continuous)
Occupation Removed from Final Model

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Lifetime Alcohol History: Tables 13-45 and I-3-32)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log _e (Initial Dioxin)	
Stratum	Initial Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
0 Drink-years	Low	10	55.88	-0.0137 (0.0241)	0.569
	Medium	12	57.44		
	High	17	56.29		
>0-40 Drink-years	Low	119	53.04	0.0066 (0.0087)	0.449
	Medium	107	56.15		
	High	107	54.78		
>40 Drink-years	Low	41	57.45	-0.0092 (0.0139)	0.510
	Medium	46	54.55		
	High	43	56.29		

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Lifetime Alcohol History: Tables 13-45 and I-3-32)					
Stratum	Dioxin Category	n	Adjusted Mean ^a	Difference of Adjusted Mean vs. Comparisons (95% C.I.) ^c	p-Value ^d
0 Drink-years	Comparison	53	51.70		
	Background RH	20	50.78	-0.93--	0.753
	Low RH	15	59.02	7.32--	0.038
	High RH	24	55.96	4.26--	0.140
	Low plus High RH	39	57.12	5.41--	0.030
>0-40 Drink-years	Comparison	696	54.34		
	Background RH	258	53.24	-1.09--	0.207
	Low RH	169	54.50	0.17--	0.872
	High RH	164	55.94	1.61--	0.128
	Low plus High RH	333	55.21	0.87--	0.278
>40 Drink-years	Comparison	276	55.35		
	Background RH	84	54.56	-0.79--	0.597
	Low RH	67	56.64	1.29--	0.439
	High RH	63	54.70	-0.65--	0.702
	Low plus High RH	130	55.69	0.34--	0.791

Table I-4-19. (Continued)
Interaction Table for α -1 Acid Glycoprotein (mg/dl)
(Continuous)
Occupation Removed from Final Model

c) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Lifetime Alcohol History: Tables 13-45 and I-3-32)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
0 Drink-years	Low	17	51.23	0.0168 (0.0170)	0.322
	Medium	18	56.60		
	High	24	57.18		
> 0-40 Drink-years	Low	204	53.58	0.0064 (0.0063)	0.309
	Medium	195	54.02		
	High	192	55.73		
> 40 Drink-years	Low	66	54.65	0.0025 (0.0100)	0.799
	Medium	77	55.97		
	High	71	55.08		

^a Transformed from natural logarithm scale.

^b Slope and standard error based on natural logarithm of α -1 acid glycoprotein versus log₂ dioxin.

^c Difference of means after transformation to original scale; confidence interval on difference of means not presented because analysis was performed on natural logarithm scale.

^d P-value is based on difference of means on natural logarithm scale.

Note: Model 2: Low = 39-98 ppt; Medium = > 98-232 ppt; High = > 232 ppt.

Model 3: RH = Ranch Hand.

Comparison: Current Dioxin \leq 10 ppt.

Background (Ranch Hand): Current Dioxin \leq 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin \leq 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Model 4: Low = \leq 8.1 ppt; Medium = > 8.1-20.5 ppt; High = > 20.5 ppt.

Table I-4-20.
Interaction Table for α -1 Antitrypsin (mg/dl)
(Continuous)
Occupation Removed from Final Model

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Industrial Chemical Exposure: Tables 13-47 and I-3-34)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Initial Dioxin)	
Stratum	Initial Dioxin	n	Adjusted Mean	Adjusted Slope (Std. Error)	p-Value
No	Low	72	143.48	-1.0188 (1.5935)	0.523
	Medium	60	154.10		
	High	50	140.62		
Yes	Low	98	143.43	2.0810 (1.1085)	0.061
	Medium	105	144.62		
	High	117	149.71		

b) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Degreasing Chemical Exposure: Tables 13-47 and I-3-34)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Initial Dioxin)	
Stratum	Initial Dioxin	n	Adjusted Mean	Adjusted Slope (Std. Error)	p-Value
No	Low	66	138.39	4.1101 (1.6990)	0.016
	Medium	46	148.91		
	High	31	149.28		
Yes	Low	104	147.05	-0.0363 (1.0784)	0.973
	Medium	119	148.71		
	High	136	147.82		

Table I-4-20. (Continued)
Interaction Table for α -1 Antitrypsin (mg/dl)
(Continuous)
Occupation Removed from Final Model

c) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Degreasing Chemical Exposure: Tables 13-47 and I-3-34)					
Current Dioxin Category Summary Statistics				Analysis Results for Log _e (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean	Adjusted Slope (Std. Error)	p-Value
No	Low	149	144.46	1.4114 (1.1474)	0.219
	Medium	109	140.79		
	High	61	149.24		
Yes	Low	138	154.57	-1.7627 (0.7890)	0.026
	Medium	181	149.93		
	High	226	148.29		

d) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Degreasing Chemical Exposure: Tables 13-47 and I-3-34)					
Current Dioxin Category Summary Statistics				Analysis Results for Log _e (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean	Adjusted Slope (Std. Error)	p-Value
No	Low	143	144.94	0.7667 (0.9628)	0.426
	Medium	115	140.06		
	High	61	151.17		
Yes	Low	147	155.23	-1.9640 (0.6813)	0.004
	Medium	175	148.49		
	High	223	149.44		

Table I-4-20. (Continued)
Interaction Table for α -1 Antitrypsin (mg/dl)
(Continuous)
Occupation Removed from Final Model

e) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Degreasing Chemical Exposure: Tables 13-47 and I-3-34)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean	Adjusted Slope (Std. Error)	p-Value
No	Low	143	144.06	1.0147 (0.9845)	0.303
	Medium	115	139.84		
	High	61	151.65		
Yes	Low	146	154.11	-1.4311 (0.7216)	0.048
	Medium	175	148.30		
	High	223	150.00		

Note: Model 2: Low = 39-98 ppt; Medium = > 98-232 ppt; High = > 232 ppt.

Model 3: RH = Ranch Hand.

Comparison: Current Dioxin \leq 10 ppt.

Background (Ranch Hand): Current Dioxin \leq 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin \leq 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Model 4: Low = \leq 8.1 ppt; Medium = > 8.1-20.5 ppt; High = > 20.5 ppt.

Models 5 and 6: Low = \leq 46 ppq; Medium = > 46-128 ppq; High = > 128 ppq.

Table I-4-21.
Interaction Table for Apolipoprotein B
(Discrete)

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Age: Tables 13-52 and I-3-39)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Initial Dioxin)	
Stratum	Initial Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.) ^a	p-Value
Born ≥ 1942	Low	54	77.8	0.93 (0.75,1.15)	0.506
	Medium	70	72.9		
	High	112	70.5		
Born < 1942	Low	119	73.1	1.60 (1.18,2.16)	0.002
	Medium	100	77.0		
	High	60	86.7		

^a Relative risk for a twofold increase in initial dioxin.

Note: Low = 39-98 ppt; Medium = >98-232 ppt; High = >232 ppt.